

THE GEOGRAPHICAL MAGAZINE

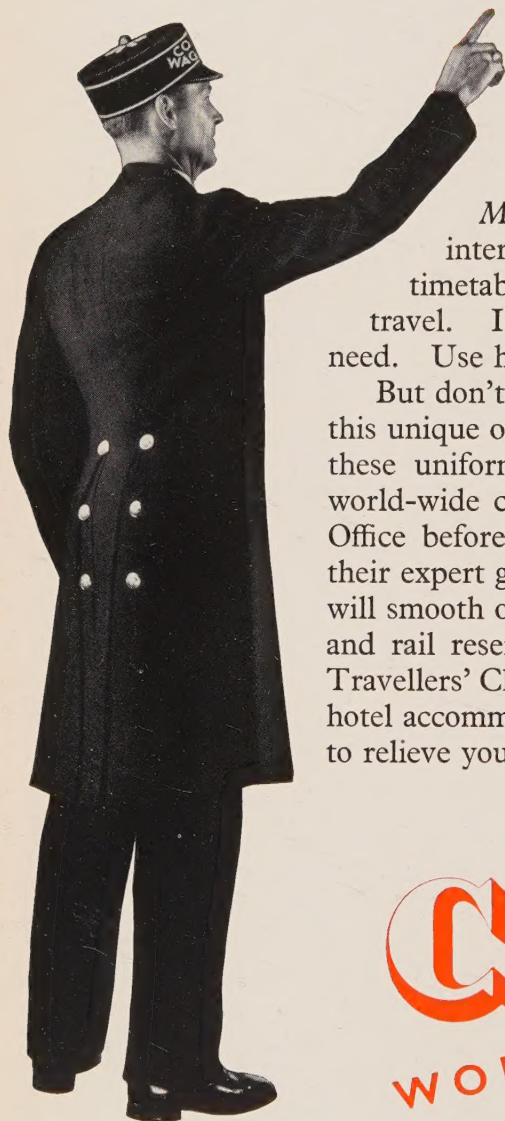
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JUNE 1939



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PHOTOGRAPHIC NOTES

Edited by F. S. Smythe

27. WHAT PHOTOGRAPHY HAS ACHIEVED IN 100 YEARS



An example of Infra-Red photography taken in Helvellyn. The green of plants is rendered white in an Infra-Red photograph because the green pigment, chlorophyll, is a good reflector of Infra-Red rays

It is exactly 100 years since the Frenchman Daguerre developed a photographic image with mercury from a silver plate stained with iodine vapour (silver *iodide*), thus presenting the astonished Victorian world with the first Daguerreotype.

In 1835, Fox Talbot, an Englishman, achieved the distinction of taking the first photograph on paper (it was coated with silver *chloride*). The picture he obtained of a latticed window in his home at Lacock Abbey is still preserved in the Science Museum at South Kensington. Talbot's Calotype was soon followed by the Wet Collodion plates, superseded in 1878 by the Dry Plates, similar to those still used today by many studio and press photographers.

Then, in August 1889, the first transparent celluloid roll film was placed on the market by George Eastman. This pliable strip of celluloid, coated with an emulsion of silver *bromide* in gelatine, paved the way for the invention of the cinematograph camera and the birth of photography's largest off-spring—the movies.

Photography has never ceased to expand its influence on mankind. Most of the pictures in this magazine are photographs printed from half-tone blocks, made by photographic means. Today many magazines and picture

papers are printed by photogravure—a process during which everything from type to pictures is photographed.

In science, photography has more than proved its value. With cameras taking 2,000 pictures a second, measurable records of birds in flight and rapidly moving machinery have been made in recent years. Photographs of stars, invisible to the human eye, are taken daily in observatories throughout the world. By means of a microphotometer the densities of these stars can be measured.

The penetrating powers of the X-rays have given physicians and surgeons a valuable aid to accurate diagnosis. The less penetrating Grenz rays have produced important, and often beautiful photographs of the structure of biological specimens. Photo-micrography has become part of the regular routine of bacteriological investigation.

By means of Infra-Red rays, aerial photographs from great heights can be taken, since these rays easily penetrate cloud and fog. Infra-Red photography is further adapted to detect forgeries and reveal faked manuscripts.

Sound is now recorded by photography, but is not the only strange thing photographed today. In last year's R.P.S. Exhibition, photographs of smells were displayed.

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The Youth Movement of Rumania

by DEREK PATMORE

Young Germans possess, in the compulsory labour service to which they are subjected, one great advantage: that of meeting on intimate terms, during their most impressionable years, groups of their fellow-citizens with whose lives their own might otherwise never mingle. They are also, it is true, compelled to absorb the Nazi creed of race-worship and contempt for individual liberty; but the example of Rumania shows that, in Rowland Hill's phrase, 'the Devil need not have all the good tunes'

THE Rumanian Youth Movement is called *Straja Tarii*, which in Rumanian means 'guardian of the country'. It was founded in October 1937 by King Carol on the same basic ideas and system as the Boy Scout movement, which he himself had initiated in Rumania when he was still Crown Prince and only fifteen years old. The *Straja Tarii*, however, co-ordinates all the youth organizations in the country, including the Boy Scouts.

The aims of the movement, which is intensely democratic in character, are to awaken a national feeling in all Rumanian boys and girls, to teach the ideal of service to others, and to emphasize the international brotherhood of modern youth. In pursuing these high ideals, the movement is pacific despite its nationalism, and because of this it stands in striking contrast to several other Continental youth movements whose only aim seems to be the encouragement of the idea of self-sacrifice for one's country, and the fanning of a warlike spirit.

During a visit to Rumania last summer, as I expressed interest in the movement, I was shown over two of the *Straja Tarii* summer camps. These are run during the holidays, and are arranged in various parts of the country. Of the two that I visited, one was in the province of Transylvania and the other in the northern province of Bukovina. Both had been constructed by the boys themselves, and in each case I was struck by the beauty of the natural surroundings in which they

had been placed. In these two districts the countryside is very mountainous. The slopes are covered with forests, and trickling mountain streams and wild flowers create a sylvan setting which seems ideally suited to the requirements of a youth camp.

Each camp is filled with boys varying from the ages of seven to seventeen, and although the discipline in the movement is strict, all the boys seemed thoroughly happy, working away with infectious enthusiasm at their various tasks. Life in camp is orderly but not too restricted, and all the camps throughout the country are run on the same lines, in accordance with the statutes laid down by the King when he founded the movement. The day in camp starts with one of the ceremonials of the movement. The boys gather to-





The band plays a great part in camp life, and its members practice assiduously on a variety of instruments. One of their duties is to summon their fellows—



All photographs by Herbert L.

—to the first ceremonial of the day, which opens with the unfurling and hoisting of the national flag and concludes with the singing of the patriotic Strajer Song



gether under the leaders in the centre of the camp, and the national flag is hoisted and unfurled. Then follows the Lord's Prayer, which is said in Rumanian. After this, the boys sing the Strajer Song, which extols their supreme leader, the King, and refers to the Rumanian flag. They must remember, the song says, that the colours of their flag recall their national heritage. The yellow represents the golden corn of the country; the blue, the Rumanian sky; while the red symbolizes the blood which their forebears shed so that Rumania might be free.

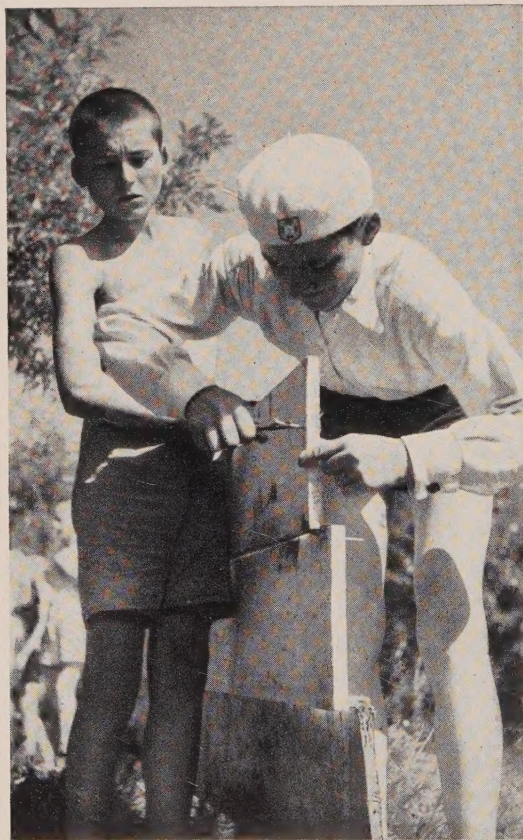
The ceremony finished, the boys have breakfast and the day's programme begins. There are physical exercises and games, some form of manual labour such as building huts or digging in the fields, and

possibly later on in the day the routine is broken by the performance of national dances and songs. In each day's curriculum, an attempt is made to vary the monotony of a regular programme. This is done by the introduction of a lecture on the history of the country or the old peasant customs, and afterwards the boys can ask questions. In every case the boys are encouraged to use their own initiative as much as possible.

One of the most interesting aspects of this youth movement is that, although it pays great attention to physical fitness, the intellectual side of life is not neglected. The boys are encouraged to hold meetings and discussions amongst themselves, and complete freedom of expression is allowed; while by means of the lectures they are continually reminded of the artistic heritage of their country. Moreover, the emphasis laid upon religion in all the ceremonials serves as a constant reminder of spiritual values.

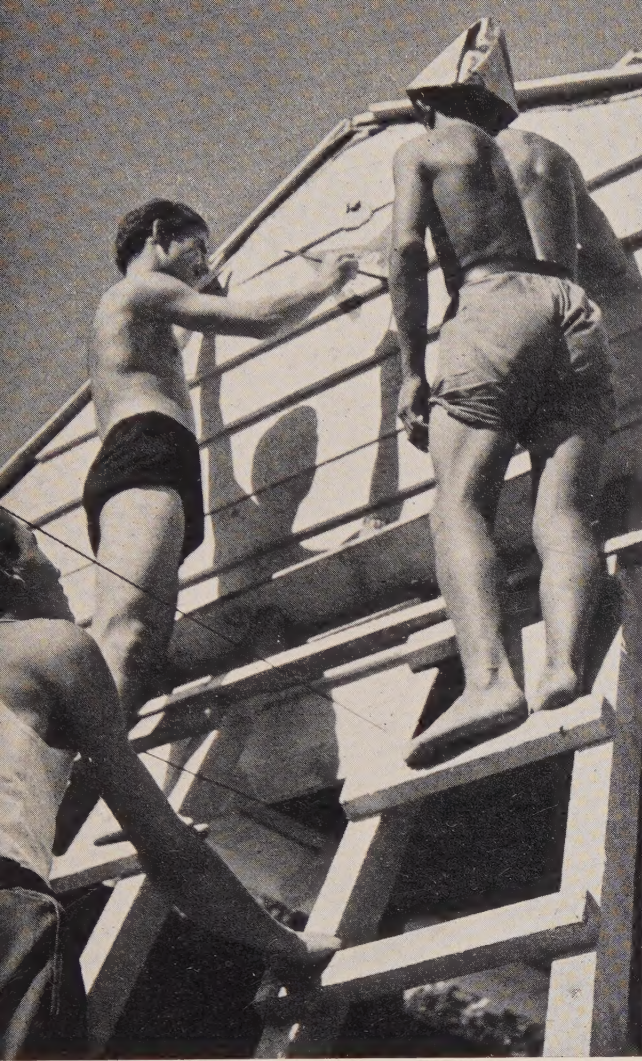
When the day in camp is ended, it closes with another ceremonial. The whole camp assembles again, and the flag is lowered. The Lord's Prayer is repeated, songs are sung—the haunting national songs of Rumania—and the ceremony ends with a flourish as the boys raise their arms in the Strajer salute and cry: "Sanatate!" which is the Rumanian for 'Good health!' and is the greeting which all members of the movement use when they meet each other.

There is something very moving about these youthful ceremonials. The landscape of Rumania has a mystical, poetical quality, and the simple fervour with which the boys say the Lord's Prayer and sing their songs seems to correspond with the feeling of the countryside. Indeed, it is in this appeal to the idealistic side of the Rumanian temperament that the strength of the Straja Tarii movement lies. A study of the formation of the movement, and an examination of the ideals and statutes laid down by King Carol when he launched it, show how well the King



The older boys readily assist their inexpert juniors

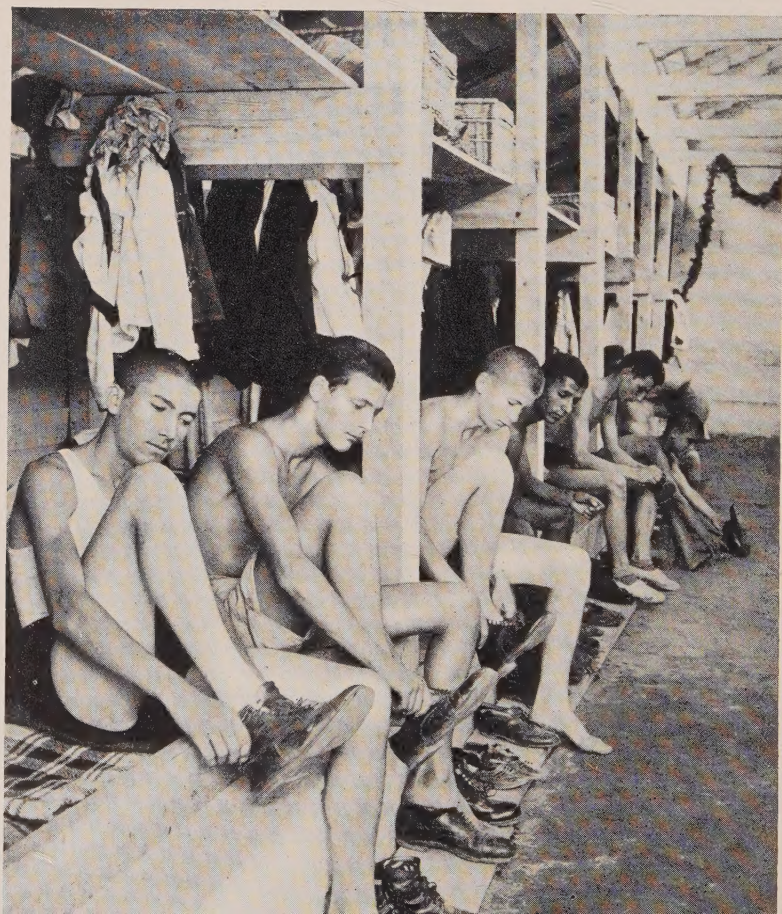
Besides being responsible for constructing their own camps, the strajers erect many public buildings, and even churches, all over the country. These pictures show them employed on a village meeting-hall—



—which they will presently adorn with a wreath of leaves, signifying the successful completion of their work. For all such labours the boys are encouraged to free themselves from restrictions of dress



Members of a 'nest', the name given to the youngest sections of the movement, enjoying an open-air breakfast in camp. The 'nests' serve as training grounds for the more advanced groups



In a camp dormitory. The contrast in types presented by the two boys in the foreground illustrates one of the chief aims of the Straja Tarii—the mingling of all classes

understood his people, and indicate the reason for its overwhelming success.

Rumania, at the conclusion of the Great War, emerged as a greatly enlarged country, having gained the additional provinces of Transylvania, Bukovina and Bessarabia. These provinces, with their minorities and mixed races, presented the King and the Rumanian Government with a number of urgent problems, the most important being how to inspire the new population with a sense of national unity. King Carol realized that the most direct method of attaining such unity was a movement which would appeal to the youth of the whole country, and the *Straja Tarii*, with its high ideals and central theme of national service, has done much to achieve this aim.

In one of his speeches made at the time of the founding of the movement, King Carol said: "We, the founders of the *Straja Tarii*, have thought that in order to consolidate this nation a movement was needed which by its powers of regeneration would penetrate into the very deepest fibres of the whole State. . . . The Rumanian is gifted with so many qualities, so many virtues, so many possibilities, all too long suppressed, that only the invincible spirit of youth can bring them to light again, and render them once more to the service of the country. I have not come amongst you to give you advice but only to tell you that your spirit is an echo of my own. We do not represent a school. We are a new impulse and a faith."

By identifying himself personally with the *Straja Tarii* as its Supreme Commander, King Carol gave the youth of the country a lead which soon carried it to success. At the present time it embraces more than a million members of both sexes—a remarkable total, considering that they are not directly compelled to enrol; although, as I shall explain later, the Government does everything in its power to encourage the youth of the country to join.

Passionately interested in educational questions, King Carol has shown his confidence in the training that the *Straja Tarii* affords by basing the education of his son, the Crown Prince Michael, on the same principles as those of the movement. Further, to demonstrate its democratic ideals, he arranged that the Crown Prince should go through his training as a *Strajer* in the company of a group of boys especially chosen from all sections of society. These boys have been the Prince's constant companions, and he has thus got to know the sons of peasants, lawyers, doctors and civil officials in an intimate, friendly way which is usually denied to the children of royalty.

The organization of the *Straja Tarii* is



Meals are provided regularly three times a day



The Straja Tarii fosters the wearing of national peasant costumes, habitual to many of the boys—

very comprehensive, and is arranged in much the same way as that of the Boy Scout movement. The country, as regards the movement, has been divided into a number of districts, each under its own commander. These commanders are selected and approved by the central office, although anyone may become a leader provided he has undergone the necessary training. The commander heads a 'legion' which in its turn is further subdivided into a number of 'cohorts' representing the boys or girls drawn from one locality; the 'cohorts' are composed of 'centuries', and

these of smaller groups. A special department in the movement has been created to encourage boys and girls working in business institutions and factories, as well as adolescents who are past the school age.

The youngest section of the Straja Tarii is arranged in a similar manner to the Brownies. These small groups of very young children are called 'nests', and serve as a training ground for the more evolved groups in the movement. Each 'nest' is taught the fundamental qualities of the Strajer or Strajare (as the feminine members are called): the spirit of comrade-

THE YOUTH MOVEMENT OF RUMANIA

ship, perseverance, patience, loyalty and courage.

In order to provide leaders for the movement, the King founded three training centres in different parts of Rumania. Two are in the Carpathians near Sinaia (the summer resort near Bucharest), at Predeal and Breaza; the other centre is at St George in Transylvania. Here, men and women who have come from all parts of the country are given an exhaustive course of training. Their services are unpaid and only part-time, their periods of duty being arranged to fit in with their ordinary work. The course takes twenty days, and consists in learning the ceremonials which form so important a side of the *Straja Tarii*, physical culture, and a study of the various kinds of social service

undertaken by the movement. The sexes are not mixed in this movement, and the two centres at St George and Breaza are used for the men, that at Predeal for the women. A feature at all three centres is a course of instruction in the history of Rumania, and the study of all branches of Rumanian folklore and the peasant crafts. The movement has thus played a considerable part in the revival of interest in Rumanian peasant art, and its leaders have done a great deal to help the peasants to keep these primitive industries alive; for example, by organizing exhibitions of peasant art throughout the country. The movement also fosters the national dances and the wearing of the national costumes which are still one of the most attractive features of Rumanian life.



—and stimulates a proper national pride through daily lectures on Rumanian history and folklore



Different groups of boys undertake many useful jobs, such as the making and mending of roads—

When he was outlining the aims and principles of his Youth Movement, King Carol laid special emphasis on the need for helping the peasant classes. Rumania has a large peasant population—out of a total population of nearly twenty millions, fourteen millions are peasants, many of whom are poorly educated and live in very primitive conditions. So the leaders of the *Straja Tarii* are taught ways in which they can help to raise social standards in the villages. Each training centre has

taken ten villages under its protection, and in each of these villages work has been started to improve hygienic conditions, living accommodation and the cultivation of the peasants' land. The leaders are also taught how to organize groups of *Strajers* who can undertake building, the digging of ditches, road-mending and the irrigation of the soil. Already, throughout the country, many new village churches and other public buildings have been constructed, and playgrounds



—and the irrigation of the land. These and other tasks are organized by specially trained leaders

laid out by members of the Youth Movement.

And so, through the elaborate organization of the Straja Tarii, peasants all over Rumania have been brought into close contact with young city-dwellers, and the democratic character of the movement is enabling the youth of the countryside and the towns to get to know each other's problems and understand each other better.

A comparison between the Straja Tarii

and the Boy Scouts reveals certain points of difference as well as resemblance. Although the Straja Tarii is in principle a voluntary movement, the King decided that all Rumanian boys and girls should be considered as automatically enrolled in it unless they express a desire not to join; though in that case no discrimination is exercised against them. This step was necessary in a backward country like Rumania, where social conditions require the use of different methods from those



A strajer recruit—the hope of Rumania

which are applicable to such highly evolved States as Great Britain. Admittedly, the aims of the Straja Tarii are nationalist by contrast with the internationalism of the Boy Scouts; but it does not advocate extreme nationalism and it does preach the universal brotherhood of man. Moreover the Rumanian is peace-loving by nature, and the encouragement of a bellicose spirit would not receive much support from the people. Primarily, the movement is cultural and physical, and one of its chief purposes has been to carry on the education of Rumanians from the time they finish their schooling. Boys can join from the ages of seven to seventeen, but after that they cannot be members as they have to undergo pre-military service

as a prelude to the national military service to which they are called at the age of twenty-one. The pre-military service was introduced to shorten the national military service. Girls, on the other hand, can join from the ages of seven to twenty-one.

The basic organization of the movement is very similar to that of the Boy Scouts. All service as leaders is voluntary and unpaid, and the only members of the movement who receive pay are those working in the central office in Bucharest. The summer camps are run to fit in with the boys' and girls' summer holidays, and the stay in a camp lasts from two to four weeks. As I have mentioned before, any man or woman can become a leader provided they have passed through the necessary period of training at one of the three training centres: there is no exclusive totalitarian party leadership. It is an interesting fact that many school masters and mistresses throughout the country have

volunteered for this work.

No one who has seen the workings of the Rumanian Youth Movement and visited the summer camps can fail to be impressed by the enthusiasm with which the boys undertake their work and enjoy their recreation. They all look so eager, healthy and intelligent that you are inspired to share their belief in the endless possibilities of social renewal which such a movement as theirs opens up. Indeed, the spirit of its leaders appears to have been summed up in the following words, spoken by King Carol at its initiation: "You, who are the soldiers of peace, the pacific army of the future, have been called upon to foster and spread a new faith in a new country."

Eskimo 'Cats' Cradles'

by T. T. PATERSON

Ethnologists have discovered the habit of making string figures among primitive peoples in many parts of the world, the figures being sometimes almost identical in widely separated regions. Mr Paterson, who is Curator of the Museum of Archaeology and Ethnology at Cambridge, learned and recorded, during a recent expedition to North-West Greenland and the Canadian Arctic, a number of the 'cats' cradles' made by the Eskimo. Readers who wish to learn more about string figures will find full information in Cat's Cradles by Kathleen Haddon (Heffer's, Cambridge, 6d.)

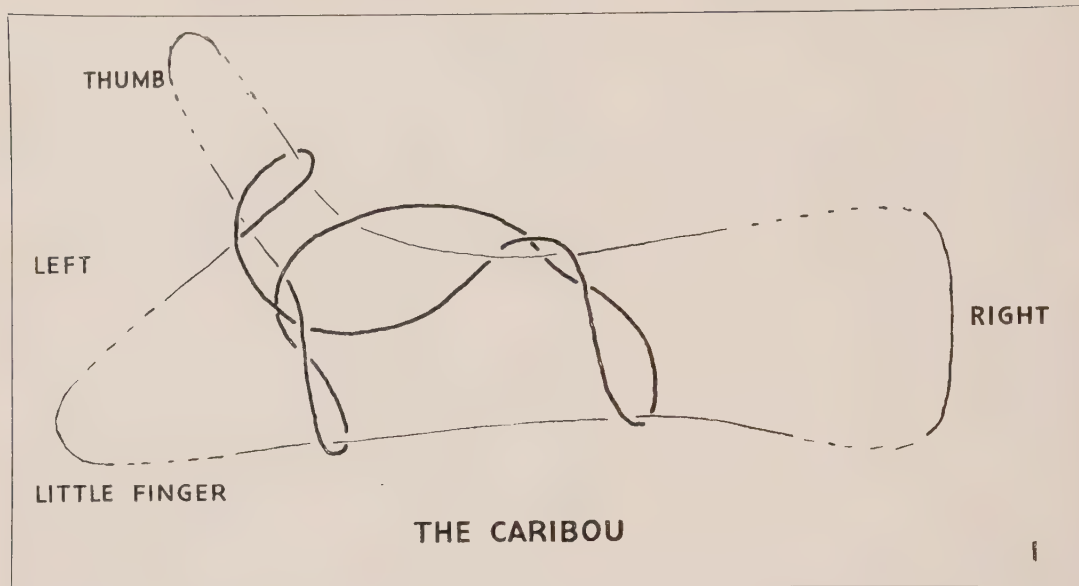
ENGLISH children play a game called 'cat's cradle', twisting and crossing a loop of string between the hands and so making figures that resemble a cradle, a mattress, a door and such like. 'Cats' cradles', or 'string figures' as they are called by anthropologists, are known to almost every people in the world, more especially to primitive folk, but their figures are generally made by one person alone, whereas our kind of 'cat's cradle' requires two people.

When I went on an expedition among

the Eskimo, I found that they had developed more intricate figures than any other group of primitive people, and, because of the significance of these figures to scientists, I learned quite a number of them. The Eskimo have no writing and, in the region where I worked, they did no drawing and only a little carving. The result was that they found in the string figures a medium of expression and entertainment, comparable to our books; though, of course, they are excellent storytellers besides.



Amaunilik, an Eskimo woman of North-West Greenland, demonstrating string figures to the author



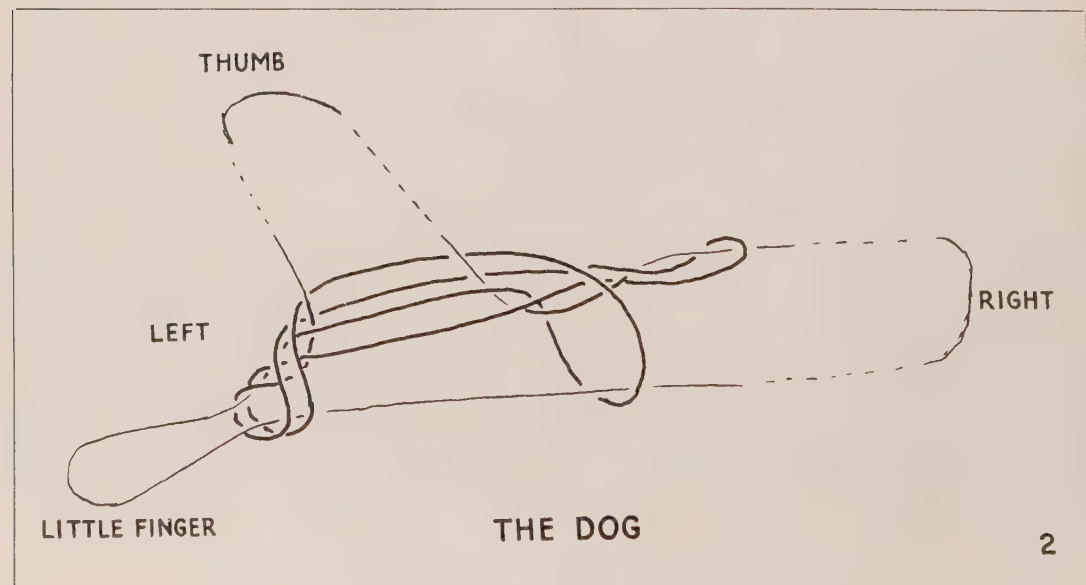
For instance, should an Eskimo want to make a picture of a caribou, which is like a reindeer, he would make a figure in string like drawing (1), the essential part of which is emphasized by a thicker line.

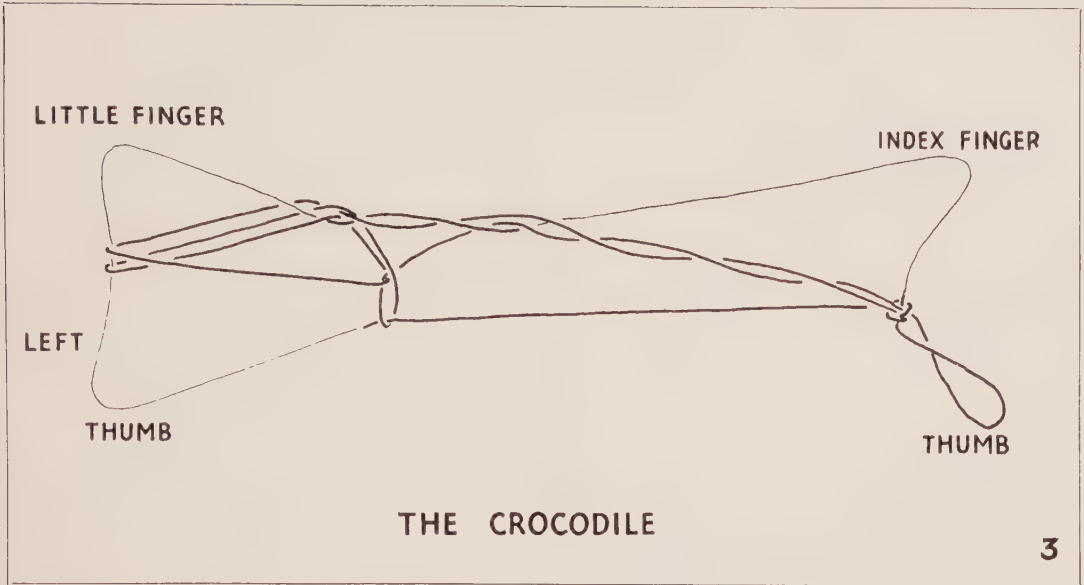
To make a dog requires a more complicated series of movements, as drawing (2) shows. It is even more realistic for they manage to show the tail waving behind.

A very interesting figure taught me by

Amaunilik, an Eskimo woman at Cape York in the north of Greenland, is called 'Kokiarsuk'. I could not find the meaning of this word until it turned out to be the Eskimo way of pronouncing the Danish word for crocodile. It can be seen from drawing (3) that it was quite easy for them to connect it with the picture of a crocodile in a book.

At first I thought this figure was made



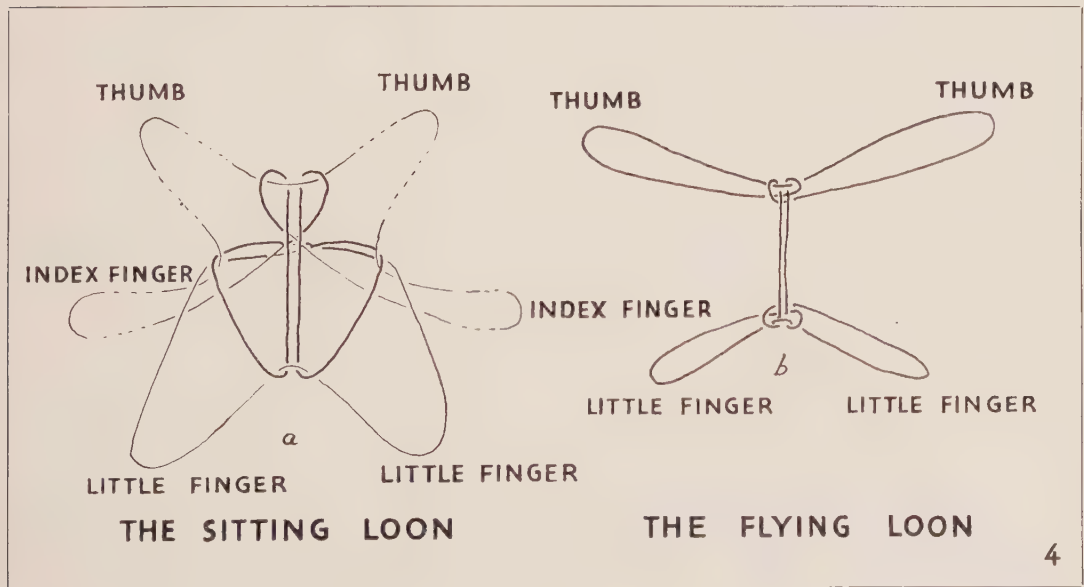


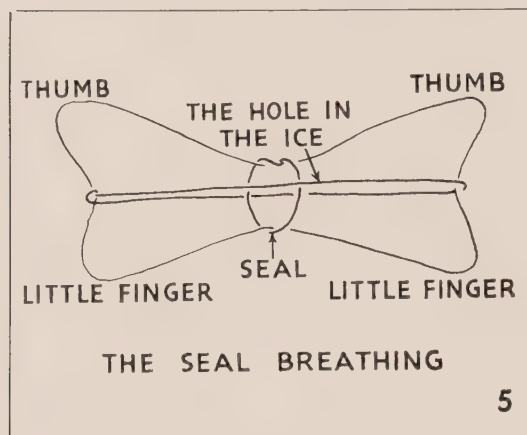
specially to be like a crocodile, but later the same figure turned up many hundreds of miles away among some Canadian Eskimo who called it 'the spirit of the polar bear'. So it seems that the Greenlanders knew the figure long ago, but started calling it the crocodile after seeing that animal in European books, finally forgetting the original name.

The Eskimo, however, do not only make

motionless figures; they can also make moving pictures with their string. Drawing (4a) shows a bird, a loon to be exact, sitting on the ground. Then they say it is frightened and dropping the string from the index fingers of each hand, they make the loon fly away (4b), the 'wings' being flapped by the thumbs.

Just as we use books so the figures are used for teaching, though in a very





primitive fashion. Here is a figure (5) which a father makes to teach his young son how a seal comes out of its hole to breathe. The circle in the middle represents the seal and the two horizontal strings on either side of it, the hole in the ice. By stretching the thumbs and relaxing the little fingers the circle is made to move upwards through the hole. That is the seal coming up to breathe. Then the man constructing the figure makes a blowing sound with his mouth, copying the breathing noise of the seal.

Naturally, since the Eskimo depend upon hunting for their whole existence, the animal life around them appears prominently in their figure-making, and so too the methods of hunting. For instance, they have a series of figures showing how a hunter stalking a seal must not be disturbed by any sound whatsoever, because the seal can be so easily frightened away.

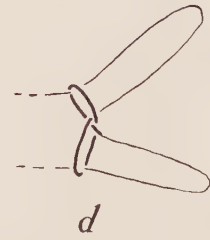
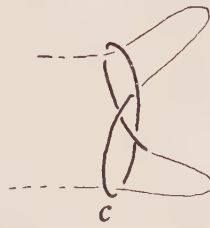
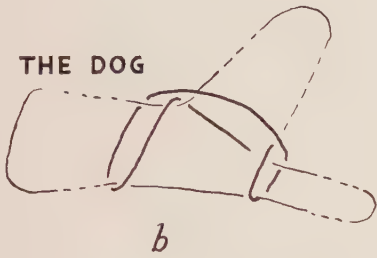
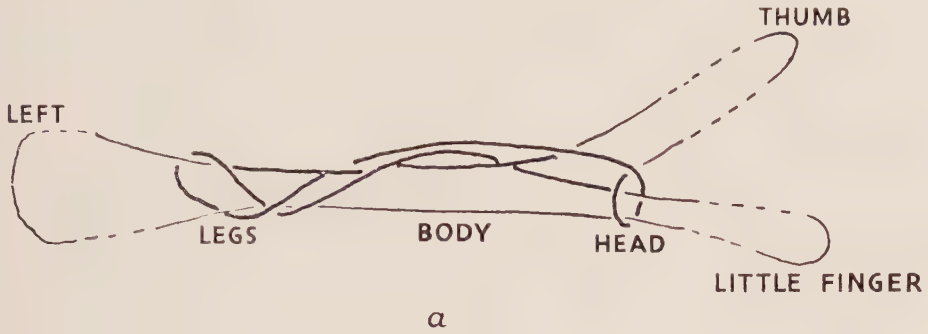
The first figure (6a) shows the man crawling along the ice. By oscillating the hands slowly 'he' can be made to move gently towards the right. By dropping the left-hand string and pulling out the top string above his 'legs' another figure is made (6b), showing a dog coming over the ice with its head down snuffling in its master's tracks. That frightens the seal away, so the man is made to stand up by pulling out the string between the dog's

legs, (6c); and by oscillating the hands 'he' is seen to move off in utter disgust into the distance, becoming smaller and smaller (6d).

Not all of their tales have a point to them as in that story. Indeed most of their stories are mere recitations of incidents without any significance whatever. In these little stories they chant, quoting the sayings of the individuals and animals shown in the figures, and as they chant, the figures move. It is just like a very primitive talking-film exhibition. One of these (7a) begins with the picture of a little bird sitting on the ground apparently eating worms, for the voice of its mother is heard to say, "Little bird, little bird, what are those worms you're eating?", then continuing, "I want some". At which request the little bird is made to run away to the right, by dropping the left-hand little finger string and oscillating the hands (7b).

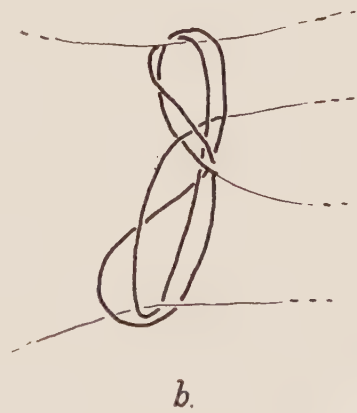
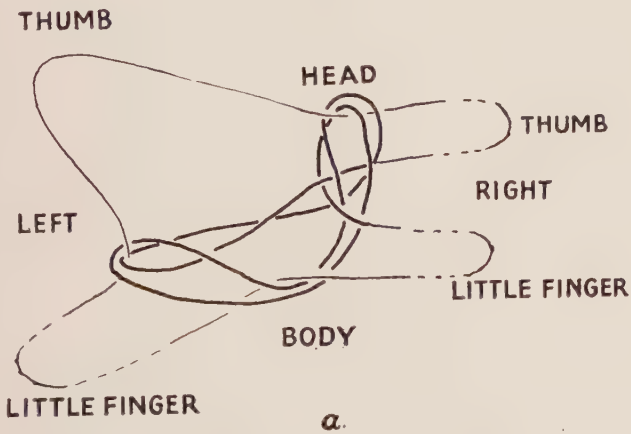
Because string figures play so important a part in what little leisure they have, the Eskimo naturally know a great number, and, since they learn from childhood upwards and are constantly teaching them to each other, the movements in making them become almost mechanical. The Eskimo woman Amaunilik, mentioned above, knew about seventy figures, but her actions were quite automatic. All I had to do was to mention some common object about us and she would thereupon draw a picture of it in string for me. But when I was learning from her and asked her to stop at a complicated part, she could not resume from the point where she had left off, but had to start all over again from the beginning.

On expeditions there is always so much to do that one cannot spend all the time on a single study, so I could not learn every figure off by heart. However, there is a way of writing them down, for each section of the string can be given a name. For instance if you hang a loop on the index finger there is a string nearer the



A MAN STALKING A SEAL

6

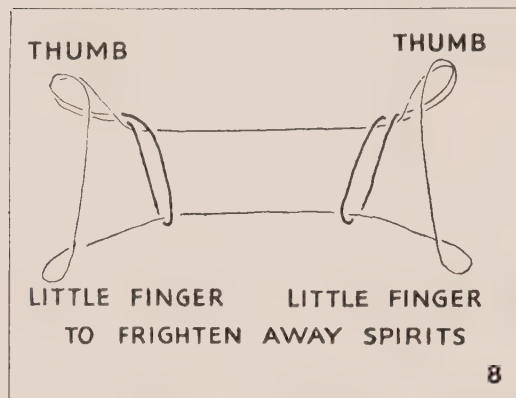


LITTLE BIRD EATING WORMS

7

thumb called the radial string, the other nearer the little finger being called the ulnar string, and if there is a second loop on the same finger that loop nearer the hand is called the proximal and the other the distal, and so on.

It is difficult to become as dextrous at working figures as the Eskimo who practise



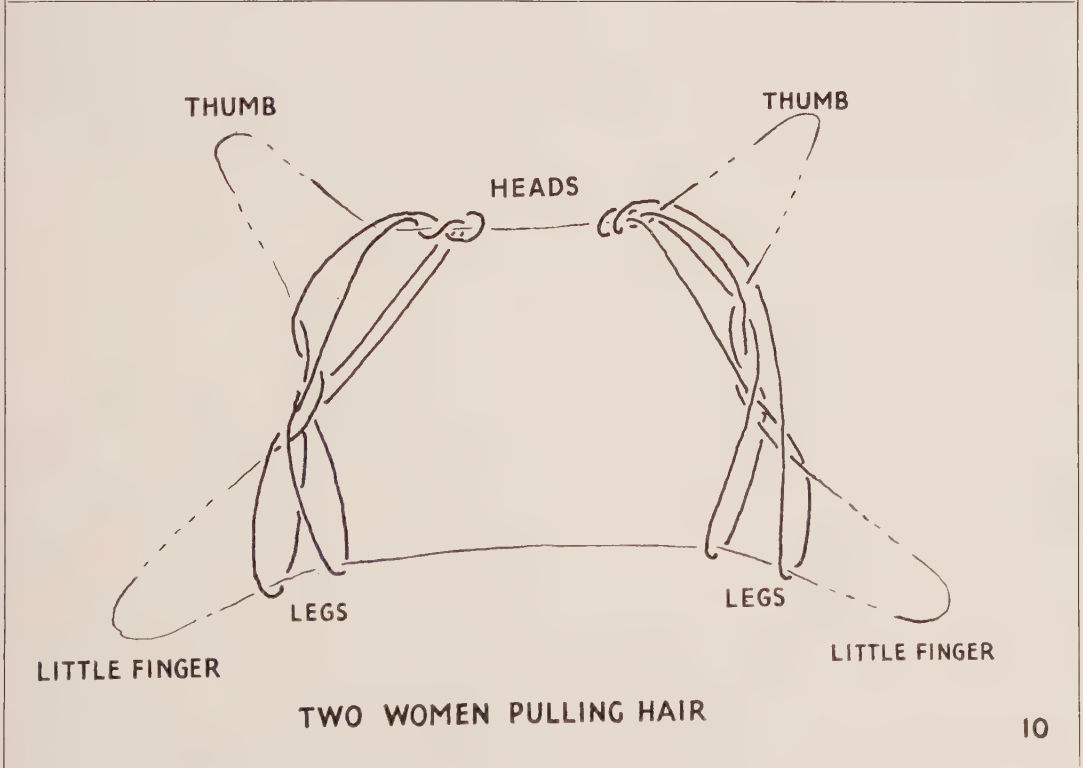
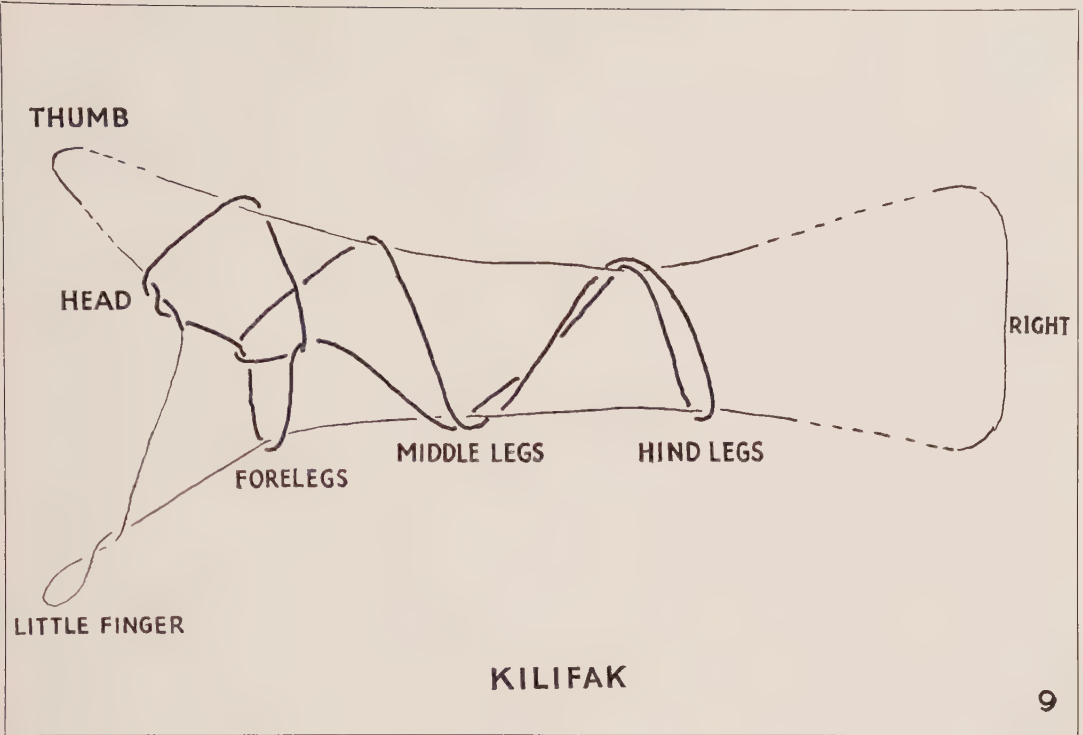
them so assiduously. One design (8), especially, do they concentrate on making with all the rapidity they can muster, for it is the figure used to frighten away the spirit of the string figures, just as people here used to cross their fingers to guard against the 'evil eye'. This spirit is very seldom seen, but it may appear, so they say, quite unexpectedly when one is playing cat's cradle, and is heralded by a rustling noise. When the noise is heard one must make and re-make this figure as rapidly as possible, saying "Ilerichi, ilerichi, ilerichi—I am happy, I am happy, I am happy", until the spirit is frightened away; otherwise there is no knowing what may happen. No one has ever seen the spirit.

The women play this game of string a lot, especially during the autumn, for they believe that the complicated strings may entangle the rays of the sinking sun, so helping to keep it above the horizon a few days longer before it disappears from sight and plunges the north into the starlit shade of the winter night. Among most Eskimo all children are taught the game,

but there is one group which says that boys should not be taught because the play with string is liable to make them clumsy with the harpoon lines and the kayak, and that leads to disaster when hunting.

An illustration of the importance of cat's cradle to the anthropologist who studies the migration of peoples is afforded by the figure (9) called 'Kilifak' in Greenland. There the 'Kilifak' is a monster who appears in many stories though nobody has ever seen one. They say it is as big as an umiak (that is the woman's boat which is up to eighteen feet long), has six legs and no tail. Moreover, should this animal be killed and a little flesh left on the bones, then new flesh will grow on them again just as good as the first. This can happen six or seven times. Now, in Alaska, about 2500 miles away as an Eskimo travels, the same figure is known by the same name. But there 'Kilifak' means the mammoth (or more accurately the mastodon) remains, which are found buried in the frozen ground with the flesh still remaining on the bones. The mastodon is not found in Greenland, and it seems fairly probable that in the latter place the idea of six legs is a relic of the description of four legs and two enormous tusks in Alaska. The story of the size, and the growth of flesh is the kind of result one would expect when no example of the original animal exists locally. Between Greenland and Alaska this figure is unknown, so it appears that the Greenland Eskimo came from Alaska, while the Eskimo in between are of different origin. There are quite a number of figures with similar occurrence.

The last figure (10) is one of the most widely known, from as far east as Greenland and west to the Chukchee people in Siberia. It represents two Eskimo women having a fight and pulling each other's hair, the figures being made to sway back and forwards. The men love making this figure.



Australia's Flying Doctors

by MICHAEL TERRY

While Europeans are coming to think of the aeroplane as a menace and a curse, the men of more fortunate continents have turned the curse to a blessing. In our April number the High Commissioner for Canada described how the aeroplane has brought new life to the Canadian North: here we see it used to alleviate suffering in the remote interior of Australia

TEN years ago I was using this typewriter by the light of a candle. Far away, in the centre of Australia, I must have disturbed somebody for it was late at night and there was hardly a sound in Alice Springs. My room in the hotel bungalow looked out upon a pitch black night pinpointed by stars more numerous, more bright, than any Northerner can imagine. I was working as fast as the keys would fly, for it was a race to get Press material finished in time for a south-bound car at dawn—and to hold out against bacterial dysentery. In those days there was no rail to Alice Springs, no radio, no telephone, electric light, water supply or sewerage. Just an office on the Overland Telegraph line from Adelaide to Darwin which had been tick-tacking since 1872, and a twisting motor road which plunged from sandhill to dry river bed, rattled over stones and brushed between trees on its 330 miles to the railhead at Oodnadatta. And a few valiant souls, say 200, who formed the only township in Central Australia.

My men and I had just won across from the most isolated goldfield in Australia—Tanami, 420 miles north-west of The Alice. After months out of touch with the world I simply had to get my message south, at once. Across the road, its iron roof gleaming ghostly from where I worked, stood the hospital. It had a bed ready. That was more than stimulating, it was a perfect godsend to know that clean white sheets, fly-proof rooms and all a fellow wants in sickness would be mine directly the last sheet was pulled from the machine. The knowledge kept one going.

And then—I relaxed. I took my medicine like a good little boy, starved as they insisted, idled as they advised and in three weeks was heading for the desert again; sound and exceedingly grateful. And half in love with one of the nurses of the Australian Inland Mission.

What a grand thing they have done for the bushmen of Australia. Yes, misunderstand me if you like; because I mean both the men behind the scenes and the nurses who watch over the sick or injured wanderers of Australia's wild inland. Caring not for the creed a man professes (one says man advisedly for women are scarce out there), not even insisting that he has one at all, they have hospital beds ready for anyone in distress. If ever mission work was done in a spirit of idealism, the A.I.M. leads in this respect. As far back as 1912 the Presbyterian Church of Australia came to see that the pioneers of the wilderness needed medicine even more than bibles. They set apart the Reverend John Flynn to work for 'Christ and the Continent'. So thoroughly has he handled his assignment, with such vision and perseverance has he devoted his life to healing first the bushman's body, then, if he likes, his soul, that today everyone in Australia has heard about Flynn-of-the-Inland.

As ever in this kind of work, money trimmed the mantle of protection which the A.I.M. sought to cast over the people of the bush. Today, however, money subscribed by the Church, by public-spirited men, by bush people themselves, also by the Powers-that-be has financed in 26 years the establishment of 11 hospitals each staffed with two nurses. If the



A.N.T.A.

The Reverend John Flynn, founder of the Aerial Medical Services, turns again to Australia's 'inland'

patient can pay, he does. If he cannot, it is not held against him. That is the way of the A.I.M.

And are bush people loyal to their inland hospitals? I found that out 16 years ago when, quite innocently, I wrote up a delightful evening at Halls Creek, far away in the Kimberleys. Believing in the value of the human document, if only as an offset to our harsh experiences coming over from Queensland, I described a couple of hours which Dick and I had when the nurses' work was over. Unfortunately the papers captioned the story 'Whisky at 2s. 6d. a nip and Jazz'. This conveyed a totally unintended impression about the girls who had devoted themselves so unselfishly to the Kimberleyites.

These fellows at once sprang to the defence with letters to the papers—and stood by to give me 'what for' when I next came their way.

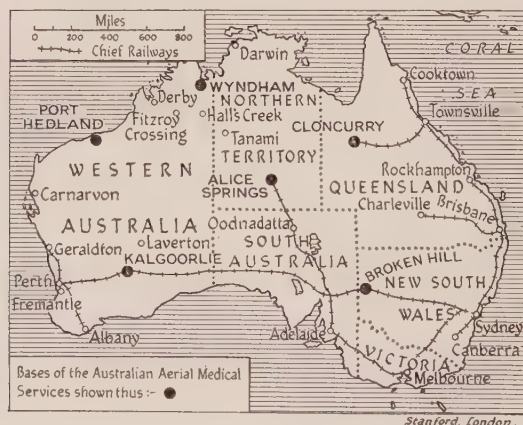
I got what for in due course. But not unexpectedly, for anyone I met within the last four hundred miles warned me: "Wait till you get to Halls Creek".

Fourteen people were living there and fourteen issued aggressively from their homes when the buzz of my trucks rang in the ranges. It nearly came to assault.

But the bush people are generous. They heard my side, allowed that it had not been deliberate, and now I can ask anyone in Halls Creek to have a drink. Of which I am proud, for I admire them greatly and we are fellows in trade.

When Flynn-of-the-Inland took the medical burdens of the frontiersmen on his shoulders a vision came to him. He knew there was not a town in the whole remote interior sufficiently large to support a private practitioner. He would starve without a retainer from the Government—and be bored because his cases in that healthy land would be few, except in injury or motherhood. He wouldn't even have burials to superintend, for longevity is natural where the roof is the stars and 'night-life' has never come.

Close to the coast Government hospitals were dotted at the denser population centres. Thither the bush casualty had, before Flynn, to make his way on horse or camel or motor. Four hundred miles to succour was no uncommon journey, every jolt a pain, every night a misery of undulled distress. How they stuck out the terribly protracted journeys in the old days beggars the imagination of those of us who expect an ambulance bell clanging in the street within a few minutes of calling the telephone operator. We who know that quiet orderly wards await us in sickness or injury must feel deeply for those who suffer the dirt and discomfort of many nights on the road till at last the white roofs of the hospital shine no less gladly upon the racked bushman than the Cliffs of Dover seem to gleam happily upon the man back after years overseas.



John Flynn knew this. He understood and set himself to remedy. Reasoning logically, he saw that doctors must be taken to patients; yes, and speeded there with feet unfettered by mother earth. A Sky Pilot by profession, his thoughts turned to the blue skies of Australia for inspiration. It came in a letter from Lieut. Peel of the Australian Air Force who, having destroyed much from the air, planned then to heal no less effectively from above. His letter, setting out how this could be done, gave Flynn the key to his problem, and mated him with a dream from which he has never been divorced an instant—for there is still much to be done.

In 1917 The Aerial Medical Services became an actuality in the mind of Flynn-of-the-Inland. He set out to sell to Australia the idea of bases at intervals round the Big Paddock (as bushmen call the unfenced land they roam beyond settlement) each with its aeroplane ready to take off as flying ambulance north, south, east or west when radio sent S O S. At Kalgoorlie, Port Hedland, Wyndham, Cloncurry, Broken Hill, Alice Springs, machines with a petrol radius of 400 miles out and back, would link with one another and thus cover anyone living at a house anywhere beyond the usual social services of the Commonwealth. They would cover all the remote inland except the still only partly explored gap between settlement in Central and Western Australia and the pitiless Simpson's Desert. The men therein are nomads, seeking gold or just exploring for the love of discovery—adventurous souls who know before they 'go bush' that no succour is likely. They must look to themselves in strength and in weakness.

Their fellows, being fixed with stock to tend and wives to consider, are in a different position. To them flying doctors are a need if not a right in their often grim struggle to subdue the wilderness for the ultimate benefit of the whole



C. H. Holmes

Wyndham, in the far north-west, is one of the six bases at which a Flying Doctor is installed

of Australia. It would, however, be little help if the doctor could not be called from the sky within an hour or two. Thus radio had to be developed so that with a really cheap set the settler would be able to signal his base.

Often disappointed, spending precious funds with unavoidable frequency, at last Alfred Traeger produced a simple transmitter: its telephony range was 200 miles, its morse three times as great; so simple that any intelligent person without radio training could work it, its power was from a bicycle-operated dynamo. Its dots and dashes were put on the air by an automatic keyboard transmitter just like a typewriter. And so in 1928, with £6000 in hand, the Flying Doctor set up shop at Cloncurry. Backed by the Federal Government, who undertook to pay half the cost of the miles flown, Dr K. St Vincent

Welch became Flying Doctor Number One.

The sort of service he renders to us can be illustrated by my experience 200 miles out of Laverton, Western Australia. Making for this lonely goldfields-town after nine months out with camels, I was leading my beast ahead of the main expedition, when a large green snake caught my eye. We had lost our favourite camel, 'King', some time before and had sworn to kill every snake thereafter. So I grabbed the only stick within reach, a piece of fire-rotted mallee, and smote at the reptile. But the stick broke off and only injured it a little. In a flash the snake swung round, reared up and leapt at me. It jumped over three feet. Alarmed by this attack, I jumped sideways to avoid its poisonous fangs, striking down with the butt of the stick as the snake missed my



*At the scene of the crime
aboriginals, chained to-
gether and supervised by
native trackers, are being
made to reconstruct an
attack on a white man.
Before the institution of
the Flying Doctors—*

*the victim would probably have
had to suffer a 400-mile journey to
hospital on the back of a camel,
the only possible ambulance and
the most painful one imaginable*



Michael Terry

Michael Terry



*Again, supposing the pro-
spector were to injure him-
self in this primitive and
ramshackle machinery—a
likely happening by the look
of it—think of him jolting
through the bush in a lorry!*

WHERE IS THE ACCIDENT?

"On the road near Boorooloola? Well, we should do it in under three hours."



A.N.T.A.

EASY WITH THE LOADING!

"The old leg feels pretty crook."

"We'll soon patch it up for you."



C. H. Holmes

C. H. Holmes

JOURNEY'S END AT LAST

"Better than the darn truck, eh?"

"My oath, it's a flash ambulance!"



knee. I killed it all right: but oh what a terrible pain immediately seized my back. It seemed as if a red hot knife was at work at the base of the spine. I collapsed. Later I tried to ride but that was too difficult. Then we remembered that Charlie Cable was not far away, following us in from the Warburton Ranges with a truck. So we camped and my mates rubbed my back to ease matters till at last the merry buzz of the old truck broke the silence of the desert.

Amongst bags, blankets and a mattress, they rigged a place for me on the back, lifted me on and gave Charlie the O.K. for Laverton.

If ever anyone longed for an aerial ambulance I did during the three days we bumped over the spinifex and sand. It would have hurt to travel upon a concrete highway in a well-sprung motor. So believe me it did hurt to move at a miserably slow speed on an empty truck whose wheels seemed steel-shod, whose gait was like a gallumphing elephant's.

And then—heaven. Matron Hart at the Laverton hospital, clean sheets, massage, rest, attention. And after a while an X-ray which said that owing to unusually large hip-bones, in twisting to smash the snake I had fouled the fifth lumbar. A crack half-way through showed how close I had been to bed for the rest of my life.

Can you understand why I tell you this? Can you see how a healthy person was suddenly in dire need of medical attention: and so injured that camel riding was not practicable? If so, you will see what the Flying Doctor, but for the extraordinary luck that Charlie was following, would have meant to me. This is what he means to every man and woman who elects to chase his and her star beyond the usual highways of mankind.

You should understand that the Flying Doctor scheme, although in the air, is still not complete. Six bases are now equipped with air-minded doctors; the rest soon

will be as Australia has caught on to the vision Flynn had so long ago. His goal will be reached.

In the meantime, when cases are urgent, some nurses have to do extraordinary things to save, say, a mother in complicated childbirth or someone who reaches them at the last gasp with appendicitis. Composing a *corps élite*, they have to be unusually resourceful, even able to operate by telephoned instructions, sent question by answer, over a land line which is complicated by repetition from one speaker to another.

Such was the triumphantly accomplished task of the Halls Creek staff when it was a case of using the knife or losing an old friend just brought in. They got on the line to Derby, 400 miles away on the coast, using the operator at Fitzroy Crossing to repeat the message they could not hear over the whole length of tick-tack line.

The doctor at Derby said do this. And they did it. They asked what next? He described what they must have seen, told where next to incise, how then to suture. Stage by stage he led them through the entire operation till at last bandages were fixed and the patient came out of the anaesthetic. Back to the ordinary ways of nursing, no patient ever had a more remarkable operation nor, happily, a less troublesome recovery.

In the bad old days, if a man went down with fever or something which the horse-doctor of the cattle station classed as 'colic', the general remedy was pain-killer. I have seen a fellow obviously sick, carrying on at his work with a bottle stuck in the pocket of his shirt. A swig now and then—who ever thought about a measured dose out there?—kept him going during the day. There are occasions in cattle work, say, if pleuro is bad, when man cannot consider himself first. There are times too when a man does consider himself first; those infrequent occasions when the craving for a 'buster' is overpowering. Then, before the air bowed



Kosmos Press Bureau

Australia's Flying Doctors would hardly have succeeded without the generous assistance of the Church. The Anglican Archbishop of Sydney christens a new aeroplane for medical mission purposes

down to his requirements and radio threw his voice more swiftly than the smoke signals of the black fellows, he turned again to painkiller. The gaudy wash so labelled was known to contain alcohol—and so the drink-craving bushman who could not get regular drink turned to irregular booze.

Notwithstanding all that the A.M.S. offers the pioneer, the traditional he-man still exists. He considers it effeminate to ask for help in sickness or injury. He sutures his ghastly wounds with a hair from the tail of his horse. The tar which he uses for sheep and horses and camels has sometimes to be applied in place of antiseptic. A friend of mine, far from anywhere, resorted to such natural remedies when a killing-knife slipped and gashed his leg. He was cutting up a bullock when the large, sharp knife slipped out of his greasy

hand and transfixed his foot, right through his boot from upper to sole. Without a moment's hesitation, leaving the knife in to stop the blood gushing, he hurried to his store, ripped open a bag of flour, cut off his boot and plunged the wounded foot deep into the clean absorbent flour. It caked and saved his life. He lived quite alone with a few working blacks, wild fellows recruited from the desert wanderers, and the nearest hospital was 150 miles away and he had only horses for transport. When I saw him he was limping but happy to be alive: had he been less resourceful I would likely have found a silent homestead and a friend who had gone to his last camp.

On my expeditions I carry a grand medical case given to me by Russell Grimwade, replete with everything an amateur doctor can use. Even ethyl

chloride for local and, *in extremis*, general anaesthesia. Not a few cases have been cured through its agency but none with more interest than that of a black fellow who had the point of a spear embedded in his thigh. Noticing his limp (he was one of my camel boys), I inquired and found the cause. He had been fighting before he entered my service and had been jabbed in the leg with a stabbing-spear. In pulling it out the point had broken off, and the skin had healed over. He had not cared. I marvelled, as a white man would have died of blood-poisoning.

Anyway, I asked him "You want 'em loose'm that one gatchi [spear]?" "Orright, Boss," he agreed.

So we got the kit ready and sprayed the place with ethyl chloride. It froze the spot all right but it amazed us also by turning the black skin white. So interested we became that everyone, including the patient, forgot for a minute that there was a purpose in the gathering.

However, I cut in and the black bore it stoically. At last, when I was being barracked by those who looked on that I'd have the leg off before I found the 'foreign body', a black point (they harden spear points in the fire) appeared. Grasping the protruding part of the wood with forceps, I jerked it out, applied iodine, bandages—and left a smiling savage sitting by his fire.

Such incidents as these serve to show the conditions in which lonely dwellers in Australia's vast interior live even today. They may help, too, to convey the importance of medical service, especially in association with air transport, not only in helping the injured or sick, but in encouraging those who are inclined to leave the cities far behind to do so. For without a chance of succour in distress, no one could feel happy about burying himself deep in the bush, especially if he is married: and without married couples there can be no satisfactory settlement.

Thus Flynn-of-the-Inland, in his care for the health of the bush people, is rendering a great service to the cause of Australia. No single man has done more to promote the welfare of inland Australia than this practically minded visionary whose achievements have made a place for him in Australian history. No individual has more suitably assisted the conquest of the frontiers which, like the Maginot Line before Paris, must be strongly held to safeguard the cities of which the Commonwealth is justly proud.

Those who carry on the work must be remembered also. The doctors who fly; the pilots who risk their lives in long cross-country flights, descend on 'aerodromes' cleared by homesteaders with little knowledge of the space a machine requires; the courageous nurses who leave so many amenities to minister to the people of the frontiers. These girls, who forgo so much that life has to offer, do, however, often find romance. In fact, that they do so constitutes an unforeseen problem, since a large proportion of the nurses sent to the Inland have married station managers or the owners themselves. Forming as they do the social centre of the tiny settlement where they are stationed, it is the unspoken duty of every bushman who arrives in town to call on the nurses, out of courtesy, as well as to enjoy the novelty of female company. Motor picnics are arranged, sometimes riding parties, even a visit to a station not too far from 'town'. Friendships naturally develop and from them deeper attachments, till soon the cattleman discovers he has found his mate at last.

As a consequence of this drift into matrimony it is now the plain girl who pleases the eye of the appointments board; for, reasonably enough, they don't want the replacement problem to distract them from the successful prosecution of their Flying Doctor Services.



Val Doone

One of Suffolk's loveliest villages is Kersey, formerly a centre of the East Anglian wool trade



Houses in the best Suffolk mediaeval tradition recall more prosperous times at Kersey—

Val Doone



Val Doone

—and at the nearby village of Lavenham, where trade centred round the timbered Wool Hall



Val Doone

Val Doone

While the woollen industry was at its height in the 15th and 16th centuries, very large sums were lavished upon architecture. Magnificent churches, such as that at Lavenham, were built—

—and many houses were decorated with pargeting, of which this cottage at Clare is a beautiful example. The flowing designs, usually of flowers and leaves, were made in raised plaster





Val Doone

Essex did not equal Suffolk in wealth. The plain, whitewashed inn at Finchingfield—
—and the thatch and weather-boarding of High Roding are typical of a quieter taste

Val Doone





Herbert Felton

Almost the largest of Norfolk's sixty watermills is that at Horstead, on the river Bure

Gates of Adventure

V. Ipswich: Port of East Anglia

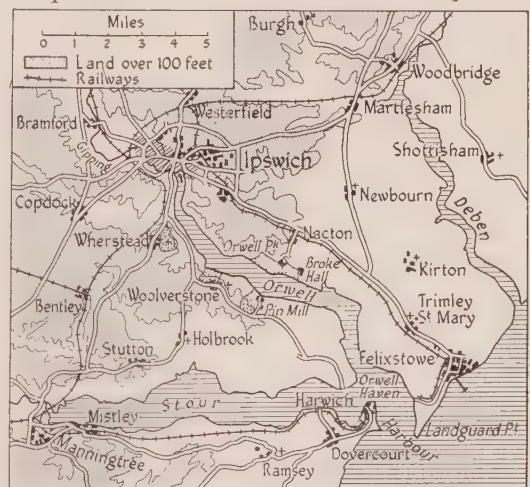
by CAPTAIN J. M. COBBOLD, J.P.

Plymouth, described in our April number, has always been a cradle of ships and seamen. Ipswich is a cradle of merchants; its story is one of trade, trade which began with the supplying of Roman garrisons on the Continent, reached its zenith while the woollen industry flourished, and today links the town with every corner of the world. Captain Cobbold needs no introduction to East Anglian readers; he is a director of the Cliff Brewery, founded by his family in Ipswich in 1746

THE earliest, and some of the happiest, memories of my boyhood are connected with Ipswich. The docks, the river and the country which surrounds the town have played a great part in my life ever since I was capable of appreciating them, and when I set out to write this article I found that my head was far too full of my own memories and impressions; yet these memories extend only over a bare forty years, which seems a very negligible length of time when I think of the three hundred years that my family have spent in or near the town. I wish I could evoke the comments of my ancestors upon the growth and contemporary history of Ipswich: upon such events as Lord Nelson's High Stewardship, Napoleon's projected landing on the East Coast, the Steam Navigation enterprise, the appointment of the seventy-two River Commissioners in 1805. Their observations upon these and other matters would indeed, I feel, be worth recording, had they been preserved; whereas those memories of mine which are not purely personal are confined to steady progress in industry, to improvements and alterations in the docks, to the erection of some important public buildings and to the general expansion of the town itself.

Ipswich is today what it has always been—a port and an industrial centre, whose architectural and historical antiquities are tucked away in the niches that have been preserved for them. Many people, visiting the town for the first time, must have felt that a general air of bustle

overrode its ancient grace and charm. I think that Mr R. H. Mottram summed up the modern character of Ipswich when, comparing the town with Norwich, he wrote: 'It always seems to be more than forty miles nearer London in spirit. People walk about its streets with a brisker air, and I never see its more important thoroughfares, even on a market day, looking as do those of Norwich, like the main streets of an overgrown village. Partly, of course, because it is, and always was very much smaller, but I fancy its inhabitants have always been more "on the spot".' Mr Mottram is right; there is, at first sight, a lack of dreaminess, of the calm and quiet of antiquity, about Ipswich. A feeling of lively, up-to-date awareness touches the streets and the people. Only when you have explored the bystreets and browsed about the small, timbered shops and taverns which shun the public



gaze with ever-increasing modesty, do you realize how much has in fact been spared by the hand of progress and how pleasantly the new may combine with the old if the balance is properly kept.

No such exploration is needed to discover the beauty of the neighbouring countryside. I know of no large town in England which can boast of more lovely surroundings. Behind it flat, rich Suffolk cornfields stretch away into the depths of the country. Beside and before it two promontories of land, well wooded, containing many small villages and large parks, run down to the sea between the rivers Deben, Orwell and Stour. This was the country which Thomas Gainsborough (who, as a young man, lived for several years with my ancestors in Ipswich) loved so dearly; 'Gainsborough's Lane', beside the Orwell, where the artist used to wander and where he painted the *Market Cart*, is now a favourite haunt of the townsfolk.

Gainsborough's delight in the Orwell and its borders has been shared by many others; time and again the country has been honoured in prose, poetry and painting, not only for its natural richness, but for its pleasant villages and fine houses. On the north bank, close to the road to Felixstowe, is Nacton, where was born a Suffolk heroine as great as any whom Thomas Hardy created for Dorset—Margaret Catchpole, whose unhappy life was so intimately connected with my own family. South of this village and overlooking the river are Orwell Park, residence of Admiral Vernon, the victor at Porto Bello, and Broke Hall, home of Sir Philip Broke, whose frigate *Shannon* defeated and captured the American *Chesapeake* in 1813. Farther east, in the parish of Trimley St Mary, on the edge of the marshes behind Felixstowe, is Grimstone Hall (now a farmhouse), the birthplace of Thomas Cavendish, who sailed round the world soon after Drake's *Golden Hind*.

The south side of the river is, like the

north, quite unspoiled. It has not so many historical associations, but its parks and halls are, I think, even more beautiful. Two of the finest are Wherstead, where Edward FitzGerald lived for a short while, and Woolverstone, which, a few years ago, was snatched from the imminent grasp of a hungry horde of speculators by Lord Nuffield, who presented it to Oxford University. That was a timely stroke indeed; it foiled a calamity that would undoubtedly have spread far and wide along the shores of the Orwell.

There are many other places that I could mention in the Ipswich countryside, but more important than any of them is the river itself. The Orwell is acknowledged to be the loveliest estuary on the East Coast; it is also, as I shall presently show, the most useful. Below Ipswich the river is some ten miles in length; it is very broad and, for the first few miles, sheltered by cliffs, woods, and high, undulating fields. Gradually the land slopes down, until, in its lower reaches, the river is bordered by wide, flat marshes. Then the Orwell joins the Stour, and the two make a wide haven behind Harwich, a haven which incorporates Harwich harbour and does not really join the North Sea until it reaches the spur known as Landguard Point on the north side.

The broad reaches of the Orwell are pleasing and beautiful to all who know them; and at all times of the year they present a lively scene, for never a day goes by when the calm waters are not astir with a variety of craft bent both on business and on pleasure. Those who seek pleasure congregate for the most part around the quays of a tiny waterside settlement on the south bank of the river, halfway between Ipswich and the sea—Pin Mill. In the old days every smuggler between Lowestoft and the Blackwater knew Pin Mill and its little tavern, the 'Butt and Oyster'. The smugglers have gone from Pin Mill long ago; they have been succeeded by the yachtsmen. All the yachtsmen in England



Edmund Lovell

Pin Mill and its little inn, the 'Butt and Oyster', must be known to all the yachtsmen in England

come sooner or later to Pin Mill; many of them make it their headquarters, laying up their boats there in the winter and returning in the summer to swell the tide of activity that sweeps continually to and fro upon the face of the Orwell.

The Orwell is the life-blood of Ipswich. The existence of the town depends upon its port; the existence of the port depends upon the river. The river has given Ipswich a unique position in the English countryside and a place in the world of commerce which is the pride of East Anglia.

The origins of Ipswich are very obscure. It certainly existed during the Roman occupation, for portions of a tessellated pavement (now preserved in the museum) and a Roman cemetery were discovered in the last century. In Saxon times Ipswich possessed a large mint, traces of

which have been found, and must already have been a considerable town. In those days it lay shield-shaped about the head of the estuary, much as it does now, surrounded by ditches and earthworks; the Saxons called it Gipes-wic, from the river Gipping, which is the name still given to the fresh-water reaches of the Orwell behind the town. The importance of Gipes-wic was realized by the Danes, who many times during the 9th, 10th and 11th centuries sent their long-boats nosing up the Orwell, packed with warriors athirst for loot which they rarely failed to secure. At least one of these raids was unsuccessful. In 885 the war-galleys of Alfred the Great caught the Danes unawares in Orwell haven; sixteen ships were taken and every prisoner was slain on the spot. By way of reprisal the Danes later levied the enormous fine of



Aerofilms

'In Saxon times Ipswich lay shield-shaped about the head of the estuary, much as it does now'

£10,000 upon the inhabitants of Ipswich—a sufficient proof, I think, of the prosperity of the town.

Ipswich had long been known as a port. Before the Viking raids it had established a trade in corn and grain with the Roman garrisons on the Continent, but this traffic was probably suspended while the Norsemen prowled the seas and made piracy a terror against which the merchantmen were helpless. Ipswich, in common with all the Suffolk ports, must have suffered terrible depredations at this time, for so little is recorded of the town in the hundred years after the Conquest that one gathers that the struggle to regain peace and prosperity was an arduous one indeed. Its fortunes began to recover after the granting of a charter by King John in 1199.

By the reign of Edward I Ipswich was a busy port once more; the exports and imports were sufficient to warrant the

establishment of a Common Quay and the appointment of a collector of Customs. The King assisted the town considerably; in return for two ships furnished for his service in Scotland, he restored the liberties of Ipswich, which he had seized on account of some misdemeanour of the townsmen, and conferred many benefits upon the port itself. It is interesting to mention that at this time the port of Ipswich was closely connected with the mysterious port of Orwell, which is believed to have lain somewhere in the region of Harwich harbour. It was a place of importance, mentioned in connexion with Continental trade in several old chronicles. Chaucer wrote of it, and it undoubtedly existed up till the end of the 14th century. After that it entirely disappeared, and what became of it no one knows to this day.

The exports under Edward I consisted chiefly of leather, sheepskin, coarse cloths

and wool. Of these the most important were the last two; they were destined to have a tremendous influence on East Anglia and to make Ipswich the industrial centre and the premier port of England. In the 14th century weaving was already carried on extensively throughout Suffolk, but as a trade it suffered badly in competition with the skilled workers of the Continent. Edward III, perceiving this, played a master-stroke by prohibiting for a while the export of unwoven wool and introducing in 1336 a large number of discontented Flemings to teach the craftsmen of Suffolk how to weave correctly not only coarse cloths, but also the finer cloths for which there was then a growing demand. For the next two and a half centuries Ipswich knew hardly a single year of depression. The Flemings stayed, and so happily did they combine with our people in the art of weaving that very soon the tables were turned upon Flanders itself, the real home of the industry. Guilds were established all over Suffolk; the merchants grew so rich that they vied with each other in the building of churches and houses.

The centre of prosperity, since in its docks and river it held the key to the export trade, was Ipswich. So many Flemish, Dutch and other foreign merchants congregated there that they were allowed a special 'colony' or quarter for their own use. Even the Black Death, descending upon the town in 1349, when Ipswich was at the outset of its grand career, could not put a check to its progress, although more than a third of the inhabitants (including the Town Clerk) were destroyed.

Edward III took a special interest in Ipswich. Being the maker and controller of his own laws, he kept a stern but intelligent eye upon the affairs of the port, making continual changes in the regulations concerning exports and imports and the comings and goings of the Brabantine merchants. He saw to it that the wool trade was used to replenish his

own coffers; and Ipswich, whose fortunes more or less depended upon the favour of this shrewd monarch, maintained friendly relations by making him frequent gifts of large quantities of wool, and allowed him at one time a duty of two shillings a tun upon wine above the usual Customs. Ipswich was the ideal port for Edward from every point of view; to a large extent it served as a naval base for the wars against the French, which, as he grew rich upon the proceeds of the wool trade, he prosecuted with ever-increasing vigour. Here, and at the port of Orwell, he gathered his great fleet of five hundred vessels in preparation for the historic battle of Sluys.

Edward always provided an escort for the Ipswich merchants against the continual danger of piracy; but after his death this happy vigilance was relaxed and matters drifted into such a state, particularly under Richard II and Henry IV and V, that there are even records of the escorts turning pirate on their own account and of ships being attacked in Orwell Haven. These outrages were eventually quelled by the firm regulations of Henry VIII.

They did little, however, to impede the trade of the port. Throughout the 15th and 16th centuries Ipswich was steadily gaining ground—in 1404 it was created a town of the Staple, one of those to which all merchandise had to be brought for exportation—and there is little to say only because its story is one of unbroken progress, wealth and industry. To that long period belongs all the greatness of Ipswich: her rare architecture, her opulent merchants, her guilds and her pageantry. And in all this record of fame and prosperity one man stands head and shoulders above his fellows: the strange, fearful figure of Cardinal Thomas Wolsey, variously described as 'the mastiff curre bred in Ipswich towne' and 'the greatest political genius England has ever produced'.

He was both. A 'mastiff curre' because his father (at least, the man who is said to have been his father) was a rough, unscrupulous fellow, a butcher, innkeeper and burgess, who sold bad meat to the townsfolk and was twice fined for keeping a house of bad repute; a genius because from these inauspicious origins he rose to hold for many years the scales which weighed the fortunes of his country.

His most ambitious scheme for Ipswich was brought to nothing. In 1528 he came with pomp and procession to lay the foundation stone of a grand college of Secular Canons with which he intended to supply the scholars for his even greater college of Christ Church at Oxford. He had raised the money by suppressing St Peter's Priory in Ipswich and about a dozen others in the immediate neighbour-

hood. The work proceeded swiftly and soon the college, which stood close to the river just behind the docks, covered more than six acres. It was but half completed, however, when the mighty cardinal crashed from his pedestal to disgrace and death. That was in 1530, and all that now remains of the fine college is a gateway. This is our only contemporary memorial of Wolsey and one of the most precious examples of Tudor architecture in the town. It consists of a red brick archway with a square hood moulding surmounted by the arms of Henry VIII, having on either side a trefoil-headed niche. After more than four hundred years it is still in wonderful preservation.

Ipswich is famous for two other buildings belonging to the same century. One is Christchurch mansion, standing in a park of seventy acres on the north side of the town. This place has an interesting history. It was originally the site of a Norman castle, dismantled without trace in the 12th century. Next it was a Priory of Augustinian canons, suppressed by Wolsey. The present mansion, built by Sir Edmund Withipol in 1549, incorporates much of the material of the Priory. Queen Elizabeth stayed here, and for two centuries this beautiful house was owned by various wealthy families until, in 1894, Mr Felix Cobbold, my great-uncle, bought and endowed it and presented it to the town. The park, now one of the seven public parks in Ipswich, is well wooded and carefully kept; the mansion itself is built of red brick, and contains a wonderful oak-panelled entrance hall with a huge open fireplace.

An even more remarkable building is Sparrowe's House or the Ancient House in the Butter Market. More than the architecture of this place, it is the ornamental carving which is so impressive. As an example of the lavish and improbable, yet at the same time delicate and perfectly proportioned, it can claim to be unique. The basement front is, between



F. A. Girling

Wolsey's Gate, the only relic of the grand college that the Cardinal, a native of Ipswich, was building at the time of his fall



(Above) *The Ancient House in the Butter Market is a unique example of the lavish and improbable. (Right) Two of the plaster figures which decorate the bases of the five bay windows*

F. A. Gerling

Adolphus Tear

the windows, a kind of orchard in oak, being covered in a profusion of elaborately carved fruits and leaves and flowers. Overhanging it are five splendid bay windows, their lower parts decorated with plaster figures representing the following subjects: Atlas supporting the globe; America, an Indian figure with a bow and arrow; Africa, a figure seated on a crocodile; Asia, a figure standing beside a camel's head; and Europe, a figure holding a sceptre and cornucopia. Many of the rooms inside are panelled with carved oak and have decorated ceilings; one contains a fireplace with pedimented doors; another has a hammer-beam roof of three bays.



The Ancient House, I think, must have been the residence of the richest merchant in Ipswich. It is symbolic of the wealth which the town enjoyed under Elizabeth and the scale of living to which the inhabitants were accustomed. Prosperity reached its height at the end of the 16th century; thereafter, with the shifting of the woollen industry to the north and west, the town was deprived of its chief resources, and by the middle of the 17th century it was estimated that trade had diminished by one-third.

But Ipswich still had plenty to fall back upon. There was corn, malt, coal and, most important of all, shipbuilding. One enthusiastic writer described Ipswich as being 'the shipyard of London' for at least two hundred years. Certainly the town built merchant ships, men-of-war and all the collier-brigs or 'geordies' for the London-Newcastle trade; the men of Ipswich were reputed to 'build so prodigious strong' that their ships outlasted those of their rivals. The decline of this excellent industry arose from two causes. First, one Henry Johnson (who came, by an ironic coincidence, from the nearby coastal town of Aldeburgh) founded in 1650 the Blackwall Yard, which became the Thames Ironworks and eventually stole most of the Suffolk trade. Secondly, there came the long and weary wars against the Dutch, which not only took great toll of Suffolk men and resources, but also affected Ipswich in a curious way that is explained by Defoe.

Visiting the town in 1687 he describes the port thus: 'The ships are unrigged, the sails, etc., carried ashore, the topmasts struck, and they ride moored in the river, under the advantages and security of sound ground and a high woody shore, where they lie as safe as in a wet dock; and it was a very agreeable sight to see perhaps two hundred sail of ships, of all sizes, lie in that posture every winter . . . while the masters lived calm and secure with their families in Ipswich'. But in

1722 he found that there were 'scarce forty good sail of colliers that belonged to the whole town'. This, he says, was because the Dutch fly-boats, taken in the wars, 'which cost nothing but the captions, were bought cheap, carried great burthens, and the Ipswich building fell off for want of price, and so the trade decayed, and the town with it'.

Although shipbuilding continued as a regular, if diminished, industry at the port up to the middle of the 19th century—between 1804 and 1813 thirty-nine war vessels were built at one shipyard alone—the whole trade of Ipswich now suffered a sad relapse. The civic authorities took such a gloomy view that they scarcely bothered even to maintain the channel of the Orwell, so that early in the last century only the smallest of vessels could be admitted to the Common Quay. In 1805, however, an Act of Parliament appointed seventy-two River Commissioners for the purpose of 'deepening, widening, cleansing, altering and otherwise improving' the river. That was the turning-point in the depression. Ipswich has but one other serious failure to record: the disastrous venture of the Steam Navigation Company, who launched a small flotilla of steam packets in 1825 in order to convey goods and passengers to London. Perhaps the boats were mis-managed, perhaps there were not enough goods and passengers to be conveyed; at any rate, they were sold up a few years later for £1800, one quarter of their original cost.

After the Act of 1805 the deep-water channel of the Orwell was 'cleansed, deepened and widened' to such an extent that thousands of tons of spoil were soon taken from the river bed. The effect of these operations was to double the population of the town in thirty years. Trade had so far increased that, in order to accommodate the great quantity of shipping, a wet dock was now necessary; one hundred and seven Dock Commissioners



Edmund Lovell

'Buildings of all shapes, sizes, colours and ages, which, with the medley of masts and funnels and sails below and beside them, give to the docks a majestic and compelling fascination'

were appointed by the first Ipswich Dock Act of 1837, and by 1841 the dock, thirty-three acres in extent and the largest in England, had been completed.

Larger and larger ships began to come up the Orwell, and in 1887 a more extensive entrance lock was constructed to admit them to the dock, within which a new public quay, 800 feet in length, was completed some twenty years later. These arrangements proved adequate for a while; but, when the channel had been further dredged and deepened so that vessels with a considerable draught could reach the dock, the problem arose as to how to get them into it, for the entrance lock could not, and still cannot, admit any ship with a beam greater than forty-eight feet. An ambitious proposition for

yet another new lock, which would have cost some £300,000, had to be abandoned at the outbreak of the Great War.

Today the dock is roughly L-shaped, its two arms being 2230 feet and 1830 feet in length. It contains five main quays, at one or other of which vessels of almost 3000 tons have berthed and discharged. A great variety of cargoes, coming from all over the world, are handled here: coal, grain, malt, roadstone, phosphate, pyrites, timber, scrap metal and many others. These docks are a colony somehow quite separate from the rest of the town, and in the musty, narrow alleyways, the little taverns and overhanging houses which surround them there is an atmosphere so distinct and ancient that the sudden sight of an Elizabethan sea-captain or a press-

gang sergeant would seem not at all out of keeping. These dim corners are shut in by the maltings, foundries, granaries, coal yards, timber yards, warehouses and storehouses, buildings of all shapes, sizes, colours and ages, which, with the medley of masts and funnels and sails below and beside them, give to the docks a majestic and compelling fascination that even the most unimaginative landlubber must feel.

When the scheme for a new lock and entrance basin was discarded, an alternative solution was found in 1923. The Cliff Quay, outside the wet dock, was extended to an ultimate length of 1800 feet, and now has a depth of twenty-eight feet of water alongside. It can accommodate any vessel capable of entering Harwich harbour, the largest yet recorded being 446 feet in length and 4392 tons net register.

Still larger ships, generally those carrying grain, unload at the three deep-water berths in Buttermen's Bay, some six miles down the river. These berths hold vessels of nearly five and a half thousand tons, and it is no exaggeration to say that any ship able to load grain at the River Plate can discharge it here.

Perhaps the busiest people of all during the years of expanding trade have been those responsible for the dredging of the river. The decision to increase the depth of the channel to a low-water minimum of nineteen feet throughout was made in 1897, and dredging operations were not suspended until 1934. In those thirty-seven years 13,125,500 tons of spoil were taken from the river at a cost of £247,800.

The inevitable depression which followed the war years is a thing of the past. For the year ended March 1919, exports and imports amounted to only 216,800 tons; in 1936-37, the peak year, they reached a total of well over a million tons. Moreover, all tonnage duties at the Port of Ipswich are now below pre-war charges, and the reduction in some cases is as much as forty-five per cent.

Side by side with the growth of the port, industrial development has taken place in the town itself. I cannot here give details of all the varied products for which Ipswich is famous, but the agricultural implements of Messrs Ransomes, Sims and Jefferies, who this year celebrate their 150th anniversary, the foundry of Messrs E. and F. Turner and the engineering products of Messrs Ransomes and Rapier deserve a special mention.

At times I have watched the development of Ipswich with alarm, fearing that the original beauty of the town and its surroundings which was the delight of my forefathers would succumb to the industrial advance. But no; only the fool denies his own traditions, and East Anglians are a race of shrewd and wise men. Mr Pickwick, though he would probably arrive at the airport instead of by coach, could go straight to the 'Great White Horse' in Tavern Street, to the very room in which he had his embarrassing encounter with 'the lady in the yellow curl-papers', and find that, except for the front having been moved back, the place had hardly changed at all; the smugglers of two centuries ago could explore once again many of their favourite inns, which have been preserved in such number that Ipswich has come to be known as 'The City of the Taverns'; Gainsborough could wander down the river and still find a thousand views to please him.

Year by year the volume of traffic upon the Orwell increases; barges, yachts, packets, tankers, colliers, steamers, tramps, cargo-boats and a score of others pass continually between the docks and the sea, so that from the air they look like coloured ants trundling to and fro upon their tiny roadstead. I think it was the combination of this grand multitude of craft and the natural loveliness of the river that moved Mr R. H. Mottram to write: 'For sheer spectacle I know of nothing south of Berwick so splendid as the ten mile stretch of estuary down to Harwich'.

The Empire of the Incas

by SELWYN POWELL

The following article is the last of a series surveying, in the light of existing knowledge, the principal remains of pre-Columbian civilization in America and the present condition of the Indian peoples among whom it arose. We believe that no similar conspectus has been published elsewhere and we shall be pleased to supply readers who may be interested with a list of the numbers in which the relevant articles have appeared, or a complete set at a special price

THE centre of Inca civilization, and that part of the huge empire which today shows the finest Incaic remains, lies round the upper reaches of the Urubamba river, running northward through the Andes. Even in this small section of the empire can be found the sudden changes that characterize the whole; it is a land of strong contrasts. In the course of a few miles you travel from the barren, rocky pass, where the river has its source in a small mountain pool, to the deep, rich, tropical canyon that leads to Machu Picchu. Hiram Bingham, the American explorer, wrote: 'I know of no place that can compare with the marvellous canyon of the Urubamba. Snow peaks loom two miles overhead. Parakeets, humming-birds, roaring rapids, orchids and tree ferns surround you.'

An engraving in a Victorian travel book inspired Bingham to go to Peru: it shows a bridge over the Apurimac, which, swaying a hundred feet and more above the roaring torrent, perilously connects the two narrow paths that cling to the mountain sides. This valley is arid; cactus and scrub sparsely clothe its slopes, yet it is not many miles from the luxuriant canyon of the Urubamba that Bingham described. He had gone there in 1911, accompanied by an Indian guide, in search of the last hiding-place of the Inca princes, when they fled before Pizarro and the Spanish invaders. Instead he found, high above the canyon and hidden by the thick undergrowth, the most magnificent Incaic remains in Peru. Apart from one unverified rumour, absolute silence had surrounded Machu Picchu until that day;

alone of all the great Inca cities it was unmentioned by historians and travellers. Pisac, Tiahuanaco, Ollantaytambo, Sacsahuaman had all been explored by generations of men from the 16th century onwards, but Machu Picchu remained unknown and unvisited until a local hacendado found it in 1902. He was an uncurious man and knew well enough the laughter that usually greeted the fabulous stories of great undiscovered Inca ruins; he wrote his name and the date on a stone and went away.

A few years later Bingham made this amazing discovery anew; he returned equipped with an expedition which chopped and burned and dug for weeks





Helène Fischer

Until Hiram Bingham discovered it in 1911, Machu Picchu had lain unexplored for four centuries. A maze of terraces, stairways and roofless chambers, it contains the finest Incaic remains in Peru

until at last the whole city stood revealed for the first time for four centuries. Now, as you stand on the mountainside, it stretches before you in a maze of terraces, stairways, gables and roofless chambers, and reaches a climax in the sundial that stands perched on its own little hill above the temples. Blue and yellow lupins and red geraniums crowd the empty doorways and a lizard slips from the warm rock that once received the blood of human sacrifices. A semicircular temple catches your eye: it was built around the curve of a rock in imitation of the Temple of the Sun in Cuzco, and is the only curved building here. Other striking remains are the King's group, as Bingham called them,

where the Inca lodged when he visited Machu Picchu, the snake rock, the stairway of the fountains and the great monolithic stairway with its ten steps cut from a solid rock, the fosse built for a last line of defence against invaders that never came, the city gate, the royal mausoleum, and the burial caves for the priests. Outside the city are agricultural terraces and aqueducts to bring water down from distant high mountain springs.

The indescribable magnificence of the scene so dominates the city that the latter hardly exists, yet it is a huge place that spreads from level to level over the saddle of the mountain which joins the two peaks of Huayna Picchu and Machu

THE EMPIRE OF THE INCAS

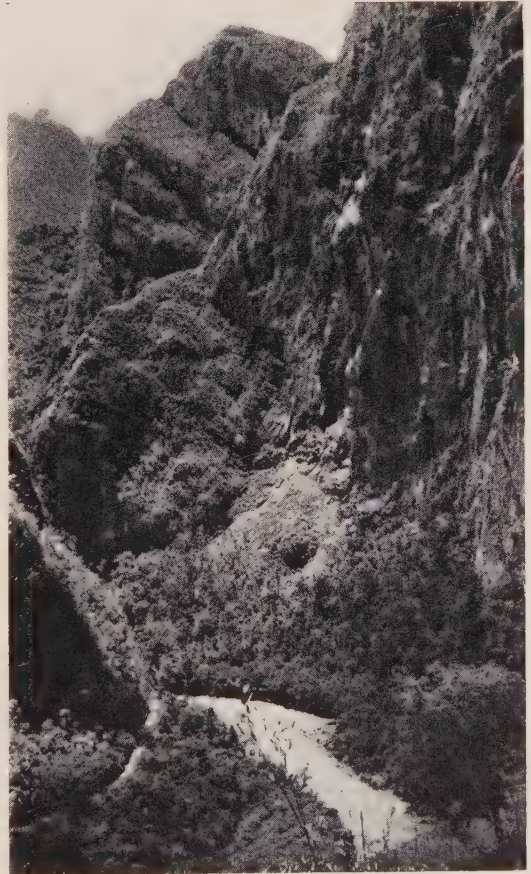
Picchu. Two thousand feet below you curls the Urubamba, making a great horseshoe, its arms on either side of you as you look down to it through the thick, greedy foliage. All around are the Andes, peak after peak in a forest of green and grey mountains as far as the highest, snow-covered peaks beyond which you cannot see.

It is impossible to deduce the whole history of Machu Picchu from the few traces of its inhabitants that Bingham and his carefully organized expedition were able to find when they opened up the city. As they saw it, in its last years the place was a kind of debased religious city where the Virgins of the Sun had been taken out of reach of the Spanish invaders. None of the bones that they found were of robust males and most of the artifacts were feminine trinkets such as bracelets, jewelry, earrings, rings, mirrors and pins, of silver, wood, stone, bronze, copper, pottery and bone.

It was obviously built on the site of an older city and like most places, it was added to as the need arose, so that we find traces of many periods and styles in the actual buildings. The Incas as we know them did not get beyond Ollantaytambo, which lies some miles up the valley towards Cuzco, until the reign of Pachacutec in the 15th century, and it was he, in all probability, who started the city as it is now, building it up entirely afresh, for there are no definite pre-Inca traces here as at Ollantaytambo. But as the empire grew, so Machu Picchu would outgrow its importance as a frontier fortress. It may even have been abandoned for a while, because it was certainly not a place of much significance when the Spaniards came or it would have been mentioned by one of them. And then in its last days it was used by the fugitives and they would be the last people to have told of its existence. For all these reasons, Machu Picchu has survived as the most untouched relic of the greatest days in the history of Peru.

But besides Machu Picchu there is plenty for the traveller to see in the way of Inca building. Ruined storehouses and forts are dotted about all over the country; remnants of temples and palaces are to be found in many districts; terraces, aqueducts and bridges remind one everywhere of the former greatness.

The most notable characteristic of all Incaic building is its stonework. Only modern machinery has equalled the precise cutting, the exact fitting and the perfect finish that the Incas achieved with their inadequate tools. For the most part the stone is an igneous grey trachyte or a reddish basalt from the quarries at Hua-



Selwyn Powell

Machu Picchu holds a position of commanding splendour, two thousand feet above the canyon of the Urubamba with its roaring rapids and tree ferns



Countess of Brecknock

(Above) Many examples of the wonderful stonework of the Incas are found at Pisac. No mortar or jointing was used, the individual stones being fitted together by precise cutting. (Below) Machu Picchu shows such architectural characteristics as doors tapering inwards and niches which served as cupboards

Selwyn Powell



cotto; it is worked up to a smooth surface, though the face is occasionally rusticated. No mortar or jointing of any kind was used and in the best examples the individual stones fitted exactly, so that there was no gap at all between them. Walls, in section, and doors, tapered inwards towards the top. Houses were often gabled and roofed with thatch. The niches, also tapering upwards, that one finds more frequently than windows, were used as cupboards; windows were hardly used, decoration almost never. It was efficient, highly advanced building, but at no point did it approach architecture. The masons' resourcefulness often gave it a dramatic quality of magnificence, however, that relieved their most important building sites from dullness, for they built in almost inaccessible mountain crags (for strategic reasons) in a way that makes Pisac and Machu Picchu two of the most stirring places that it has been my lot to visit.

Pisac is perched high above the later village of the same name on a jutting spur of the Andes, overlooking the sacred Urubamba that winds in its flat fertile valley down to the Amazon and the Atlantic. On horseback you climb the vertiginous heights from terrace to terrace, up steep rocky paths that promise an even more sickening descent, until the valley lies stretched beneath you in a minute panorama. The ruins themselves would be nothing without the site and without a background of history to help you build them up into reality, for they are not beautiful in themselves. A guide shows you the priests' room, the royal apartments, the *intihuatana* (the sacred sundials by which the equinoxes were made known); but to your sceptical eye it is all a matter of conjecture; the archaeology of these buildings cannot conjure for you a picture of the bands of Indians filing up the steep paths, the litters of nobles and the gay panoplies of the Incas as they travelled to their country palaces covered in ornaments of gold and silver and clothed in mantles

of brilliantly coloured feathers. One is not sufficiently familiar with their trappings to be able to cover these walls in imagination with the soft vicuña wool hangings, the creamy pelts of vicuñas or alpacas, or the thicker, coarser skins of llamas; or to establish cups and jars and bowls in the niches and carpets on the floors. The *intihuatana* are meaningless blocks of stone, and the temples are deserted rooms. There are no carvings, no frescoes, nothing to give life or meaning to these empty ruins. As at Machu Picchu you look away, out from the buildings, over the brown mountains, to the snowy peaks beyond.

Cuzco itself contains plenty of Inca relics—vestiges of the palaces that each



Countess of Brecknock

At Pisac, on a spur of the Andes, 'you look away, out from the buildings, over the brown mountains, to the snowy peaks beyond'



Selwyn Powell

The church of San Domingo incorporates the scant remains of the Temple of the Sun at Cuzco, the richest and most gorgeous temple ever devised by the Incas. It was the residence of the imperial family—

Martin Chambi



—until Inca Roca built the palace of Cora Cora; the foundation wall of the palace, now surmounted by white-washed Spanish adobe, stretches along the right-hand side of this narrow street



Martin Chambi

An amphitheatre in the hills near Cuzco. Inca masons showed great skill in adapting natural rock, either cutting out of it or, as with the platform in the centre, building round it

Inca built for himself, traces of temples, royal schools and baths—but they have all been ruined or incorporated in Spanish buildings. The brown, neat stonework forms a sober base to the white or colour-washed adobe of the provincial baroque of the Spaniards. Narrow streets and solid, plainly built doorways are the most common legacy of Inca times, but here and there you find more exciting and more ambitious traces: the Temple of the Sun, for instance, which is shown you by the black-and-white robed monks of San Domingo; or Cora Cora, the palace of Inca Roca, with its huge twelve-sided stone in the street wall, a perpetual monument to the care with which the Inca's masons built. And above the town is the fantastic fortress of Sacsahuaman, pre-Inca for the most part, but added to by Tupac Yupanqui, grandfather of the two Incas who were ruling at the time of the conquest. The earlier part, built in the first

Tiahuanaco period (100 B.C.—A.D. 700), contains a zigzag wall of immense stones, roughly hewn but carefully assembled, that were brought many miles across the mountain valleys from distant quarries. Tupac Yupanqui added to the fortifications at the same time as he built his palace at Chinchero, in the mountains above Cuzco, but of that only a wall remains. Indeed, all round Cuzco for some miles can be found traces of buildings of various dates, forts, granaries, rest-houses, that are so fragmentary as to be of little interest even to archaeologists.

Ninety years ago, when Prescott wrote, in the first book of the *Conquest of Peru*, his famous account of the Incas' civilization, archaeology could afford little or no aid in the composition of the picture. It is true that he was able to draw upon a number of authorities whose narratives had been compiled within a short time of the Spanish conquest—Sarmiento, Onde-

gardo, Cieza de Leon, Garcilaso de la Vega; all these took their materials direct from natives who had lived under Inca rule, while the last, whose mother was of the Inca blood royal, claimed to be a great-grandson of Tupac Yupanqui. But since Prescott's day the results of archaeological research, and of access to a wider range of contemporary documents, have given us a more accurate view of the arts and institutions which were in existence on the arrival of the Spaniards.

The origins of the Incaic dynasty, on the other hand, regarding which the early Spanish writers retailed plenty of stories, remain obscured by a dozen conflicting legends. Of these there are two groups: the truer versions, handed down among the Incas themselves—stories of the skilful trickeries they resorted to in order to get their power—and the more mystical tales which were told to their subjects.

It is almost impossible to give a brief account of these legends, as each one differs in some important detail, but the actual occurrences on which they are based appear to have been as follows. The whole country was inhabited by small clans or tribes, of which the Incas were one. Their rise to power was a carefully thought-out campaign and their *coup* was an astute trick. It had been put about that the Son of the Sun was being sent to rule the world and would appear on earth at a certain time. Inca Roca, a member of this tribe, emerged from a cave on the hillside, clothed in glittering gold spangles. The effect was perfect and the foundations were firmly laid for what was to become the world's most complete despotism. The rest of the story is one of a clever blending of good generalship and even better colonizing. As each successive Inca followed his father he built up and extended the empire. Periods of conquest alternated with periods of consolidation. The districts conquered were made contented and if this was at all difficult, the discontented element would be transported

wholesale to another part of the country and replaced by more suitable people.

By the beginning of the 15th century the Inca empire covered 185,000 square miles. Pachacutec reigned from 1440 to 1448, and under him the dynasty and the empire were at their height. Philip Means, the historian, wrote of him that 'he was perhaps the greatest man ever sprung from the native race of America', and it is reasonable to suppose that if the Spaniards had attempted the conquest at that time they would have failed, for in the hundred years that followed his reign the empire outgrew its strength and began to crumble; it was doomed almost before Pizarro came.

Pachacutec's son, Tupac Yupanqui, built great temples and palaces, and he continued to add immense tracts of country to the empire. The increasing dynastic pride of the Incas is evident from the fact that he is the first of them of whom it is known for certain that his wife was also his sister. Many of his forebears are reputed to have married sisters, but the historians are so contradictory on the subject of the Coyas (Queens) that it is useless even to attempt to unravel the confusion. Tupac Yupanqui was a sick man in his later years and so was his son, Huayna Capac, and it is easy to see in the rather debauched lives that they led and the intense degree of inbreeding that they had achieved, the reasons for the downward trend of their dynasty and empire.

By 1500 the Inca ruled over 380,000 square miles of country more varied than any that has ever come under one government. His empire included all the territory from north of the equator to the river Maule in Chile, 36 degrees south, and from the coast to the jungles of Brazil and the Argentine on the eastern slopes of the Andes. The whole of modern Peru, Bolivia and Ecuador and part of Brazil, Chile and the Argentine were at the end under the rule of the Incas, who had built up this enormous and efficient empire in the years since, roughly, A.D. 1000.



Selwyn Powell

Overlooking Cuzco is the fantastic fortress of Sacsahuaman, dominated by the throne (above) from which the Inca presided over important ceremonies. The northern walls of the fortress (one of which is seen below), belonging to the pre-Inca period of Tiahuanaco I, were built with huge, roughly hewn stones, brought many miles across the mountains

Selwyn Powell



When Huayna Capac died in 1529, he divided his empire into two, leaving the southern part, with Cuzco as its capital, to his rightful heir, Huascar, and the northern kingdom to Atahualpa, who was his son by a daughter of the deposed king of Quito and in this way had some right to it. Whether this action precipitated or merely anticipated the civil war that was raging when the Spaniards arrived in 1532, it is difficult to tell; but at least it is certain that the Incaic empire had seen its greatest days in the time of Pachacutec.

Such, in the very barest outline, is the history of the Inca empire. It is a history of an astute and wise family that for nearly five hundred years was able to conquer without making enemies and to take advantage of the culture and abilities of its foes.

If the early records of the Incas seemed uncertain to Prescott, nothing was known, in his day, about their predecessors in Peru. 'We may reasonably conclude', he wrote, 'that there existed in the country a race advanced in civilization before the time of the Incas. . . . Who this race were,

and whence they came, may afford a tempting theme for enquiry to the speculative antiquarian. But it is a land of darkness that lies far beyond the domain of history.'

Since then, archaeologists have succeeded in partially lifting the veil. Archaeology relies chiefly on tombs for its knowledge of these people, whose overwhelming preoccupation with death made them lavish in their ceremonial and generous in their legacy of the common things of a life that would otherwise have completely passed away. Textiles, pottery and ornaments have been found that give a complete picture, not only of the Incas, but of their more cultured predecessors of the Chimu and Nazca civilizations on the coast.

These earlier civilizations are important in considering the Incas because their influence on the conquering race was immeasurable. Their relation in time to the Incas, as well as to the civilizations of Central America (with which they appear to have had no direct contact), is shown most simply by the chart given in Means' *Ancient Civilizations of the Andes*.

TABLE OF COMPARATIVE DATES OF THE CENTRAL AMERICAN AND THE ANDEAN AND COASTAL CIVILIZATIONS OF PERU																				
B.C.		A.D.																		
		100—	0—	100—	200—	300—	400—	500—	600—	700—	800—	900—	1000—	1100—	1200—	1300—	1400—	1500—		
Central America	Archaic and Introductory	‘Old Empire’ of the Mayas and period of northwardly expansion into Yucatan					First period of decline		‘New Empire’		Toltec period		Second decline							
Andean Area	Archaic and Migratory	In the highlands, Advanced Archaic or Tiahuanaco I period					Tiahuanaco II ‘empire’ both on highland and coast		Decline		Early Incas		Inca empire							
		Early Chimu and Nazca cultures arising from archaic on the coast							Decline		Late Chimu and Nazca on coast									



The Incas' predecessors were in many respects more cultured than they. The Puma Gate at Tiahuanaco, for example, shows 'a greater feeling for architecture than is found anywhere else in Peru'

There are few remains of the two Tiahuanaco periods. The first is represented by the colossal rocks of the older part of Sacsahuaman, above Cuzco, a single wall at Ollantaytambo and the great ruins at Tiahuanaco in Bolivia. The building of this archaic and primitive civilization was on a magnificent scale, with cyclopean blocks of roughly shaped stones that are impressive only for their size. Unfortunately, there is no more than the city itself to represent the architecture of Tiahuanaco II; it shows a very highly developed sense of design in its sculptured decoration and a greater feeling for architecture than is found anywhere else in Peru. The Puma Gate at Tiahuanaco is an entirely satisfying piece of design, with its bold border of

squared pattern and the great carved head, central above the doorway in its framework of geometric figures; and the flight of monolithic steps is, from a purely architectural point of view, better than anything to be found at Pisac, Machu Picchu or Ollantaytambo. But architecture seems to be as far as they reached. Almost no pottery and textiles have been found, though admittedly hardly anyone has been to look for them, for no part of the country has been examined with less care than this tremendously important area around the southern shores of Titicaca. Cuzco has for years lived on its archaeological reputation; the surface has at least been 'scratched' on the coast in the last two decades; little more has been done at Tiahuanaco than to make use of its



Hélène Fischer

In balsas, flimsy craft made of tortora-reed, early pilgrims crossed Lake Titicaca to the sacred islands where the first Inca, the Son of the Sun, claimed to have come to earth

archaic carvings as ballast for the railway lines.

At the southern end of Lake Titicaca are the two islands of Titicaca and Koati on which have been found pre-Inca monolithic images and some unusual crowstepped gables. According to one of the legends, it was from these islands that the Son of the Sun set forth on the journey that ended in Cuzco, and it is clear that they were venerated. One can imagine early pilgrims making the crossing in the reed *balsas* that are still occasionally used on the lake.

But it is the early coast civilizations that have left the most interesting relics. Nazca and Chimú, both early and late, were developed to a higher cultural pitch than any of the other South American civiliza-

tions and in many ways even the Incas themselves never equalled them; their textiles and their pottery were unsurpassed.

The enormous graveyards up and down the coast (where the almost complete absence of rain has helped to preserve mummies and fabrics that would otherwise have perished long ago) tell us a great deal more than the ruined buildings that alone remain around Cuzco, of the origins and lives of these people, for it was the custom to inter with the dead all their precious things and some of the most beautiful and best beloved of their wives. The richness of these tombs may be judged from the fact that Juan de la Torre, one of Pizarro's followers, took 50,000 dollars worth of gold and emeralds from a single grave that he had been told about by the

family of his Indian wife. Each district used to bury their dead in a different way, a survival from the days when each represented a separate tribe; their clothes were (and indeed still are) quite different, so that Cieza de Leon, writing in 1550, was able to say that 'though there were 100,000 men together they were all known by the distinctive mark on their heads'.

Of the less gruesome relics left by the pre-Inca civilizations, Pachacamac, the great temple just south of Lima, and Chan-Chan, capital of the Chimu empire, near Trujillo, are among the most important. Pachacamac, now a sandy mound rising out of the desert, a ruin of broken steps and gateways dominating the coast and the restless Pacific, was one of the most majestic temples to be found anywhere in Peru, and not even the great Temple of the Sun at Cuzco outshone its splendour. Its

walls were painted with the figures of 'fierce creatures'—jaguars and foxes probably, whose ghostly outlines can still be traced. There were, too, stately apartments where priests and pilgrims lived, and there was a great cemetery where only priests and pilgrims were allowed to be buried. It has yielded most of its dead to the mummy-hunters now, and the pitted cemeteries scattered with bones and fragments of funerary pottery are all that remain of the elaborate rites and ceremonies, the magnificent tombs, the pomps and splendours of an ancient civilization.

Chan-Chan is more interesting to a casual observer, although little enough remains of a city that once covered 11 square miles. There, too, one must imagine the towering adobe walls, the great pyramidal *huacas* where the dead were buried, the walled streets and the



Selwyn Powell

Cemeteries of the pre-Inca coastal civilizations have given archaeologists much information. The dead were wrapped in beautiful textiles; pottery, jewels and favourite wives were buried with them

houses with their intricate and beautiful designs incised in the adobe or painted onto the plaster walls. Only a few of these richly decorated walls are left in the vast, bewildering maze of red earth ruins, between the mountains and the sea, that formed the capital of one of the most cultured of the peoples who were to contribute so much to the civilization of the Inca empire.

In the space available, I can only give the briefest sketch of conditions in that empire, in so far as they are known to us, immediately before the Spanish conquest. As the empire grew, roads were built and a system of post-houses set up with runners that made communications faster and more efficient than they have ever been since. The journey to Cuzco from the coast was done in two days; even now it takes three by train. Only aeroplanes have equalled or improved this extraordinary record of the Incas.

The empire was divided into four sections, with Cuzco at the centre, and there was a system of supervision that extended down to villages and even families. There was no liberty—even marriage was controlled. Land was apportioned to families according to the number of hands to work it, and from manhood to middle age every healthy male was obliged to work a number of days each year on the land of the Inca and on the temple lands of the Sun, which represented a third each, the people themselves having the remaining third of the total acreage in each community. Although absolute poverty did not exist, it was also impossible to be at all well off and the standard of living was probably not high. The privileged nobility of the blood royal, though they lived in considerable state, led a simple enough existence, with only two meals a day, the principal one being in the morning, with a lighter one at night. But from highest to lowest they drank enormously, and in addition to their chief wife, who was absolutely permanent, they

were given other wives by the Inca as a form of reward. If the chief wife died she was replaced by a new one, who in her turn had precedence over the others. In this way they avoided the possibility of secondary wives murdering the chief wife in order to take her place. In the case of the Inca nobility there were, naturally, refinements of living not available to the people. The intricate systems of runners that were posted along the roads in relays made it possible, for instance, to bring fresh fish for them from the coast in two days. Their garments and hangings and bed-clothes were made of vicuña wool (which Philip II himself adopted for his bed after the Spanish conquest) instead of the llama and alpaca wool or cotton that their subjects used.

And yet in many ways they were strangely backward. The wheel and the arch were both unknown to them and they were unable to write. Their only aid to memory were the *quipus*, knotted strings of different colours with which they were able to keep accounts, to count in thousands and to do a form of decimal division fully as efficient as any in use today. Returns of births, deaths and marriages and other population statistics; returns of revenue; economic reports relating to crops, the distribution of materials to workmen and the amount of stores in the royal magazines—all these were recorded by means of the *quipus*. They were also of some assistance to the *amautas* or teachers in recounting the chronicles which otherwise could only be communicated by oral tradition.

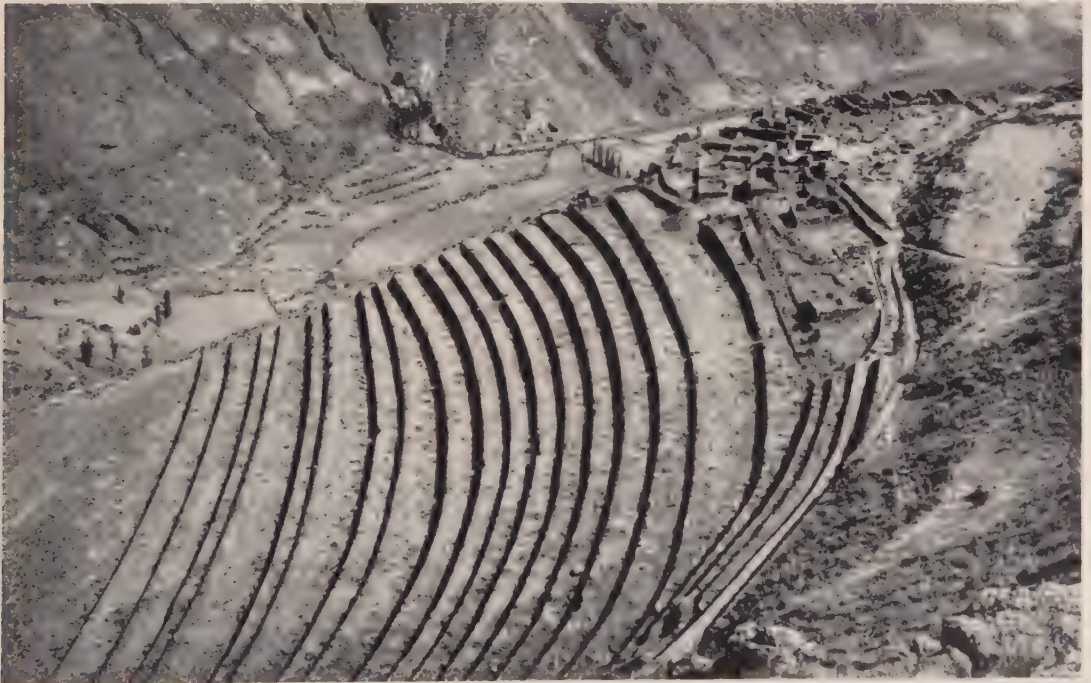
Perhaps the most remarkable achievements of Incaic civilization lay in the realm of agriculture. From the high Andes to the sea-coast, 'every inch of good soil was tasked to its greatest power of production, while the most unpromising spots were compelled to contribute something to the subsistence of the people'. Countless terraces protected the tilled soil of mountainous districts against the dangers of



Inca terracing near Pisac. Not only did the Incas thus protect the soil of mountainous districts against erosion: they built irrigation canals and knew the use of manure, avoiding by their skill in agriculture the fate that overtook the Mayas, who exhausted the land without renewing its fertility

Martin Chambi

Martin Chambi





Selwyn Powell

Francisco Pizarro, conqueror of the Inca Empire

erosion. Unlike the Mayas, the farmers of the Inca empire were well acquainted with the value of manure, and made great use of guano from the islands of the coast. The staple crop of the high Cordilleras, above the limit of maize, was the potato, unknown to the inhabitants of Mexico and Central America before the Spanish conquest.

The Incas also built irrigation canals, including one magnificent example twelve feet deep and twelve feet wide and a hundred and fifty miles long, which began at the mountain springs near Parcu and watered the high valleys of the Chanca district. Their superb stonemasonry and intricate knowledge of levels enabled them to put enormous areas of desert or arid ground under intensive cultivation. Cieza de Leon described their irrigation works in the waterless region of the sea-coast as

follows: 'They drew trenches through such places as is very strange to mention; for they carried them through high or low grounds, along the sides of hills and mountains, and many of them across one way and some another which renders it extraordinary pleasant travelling over those vales because they all look like delightful gardens and groves'. The Indians, he says, 'were and still are very industrious in carrying water along these trenches, and the rivers never fail'. They were fed from the snow water of the high Andes, so their banks were always green and grassy in a land that is absolutely without rain.

In little more than a decade after the Spaniards had precipitated the disintegration of the empire, the material and moral state of the peoples whom it embraced had begun to decline. Cieza de Leon, like other contemporary writers, noted this. 'The fault', he wrote, 'lies in those who have been sent to govern . . . for it appears to me that few nations in the world had a better government than these Incas. I approve of nothing in the present rule, but rather deplore the extortion, cruel treatment, and violent deaths with which the Spaniards have visited these Indians, without considering the nobility and great virtue of their nation.'

The decline continued for four hundred years. Squier in the late 19th century found that 'Travel is infinitely more dangerous, facilities less, laws more lax, and the moral standard of the people lower. The civilization of the country was far higher before the conquest than now.'

For a long time now we have been used to hearing the echo of Bolivar's cry, 'Europe is crumbling—the future of the world lies in South America'. That might well have proved true, and may prove so even yet, but the time is far off. South America sank to its lowest depths a hundred years ago; the upward climb is as slow as the decline was swift, and it will be many years before it sees a government as wise and sure as that of the Incas.

The Sudan Gezira

II. The Irrigation Scheme

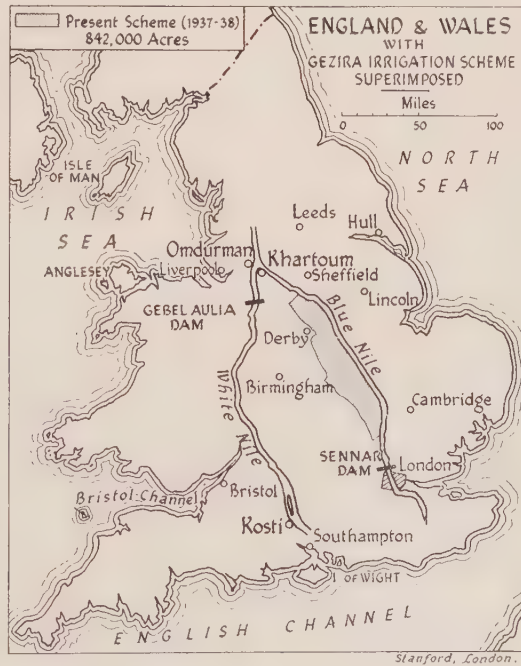
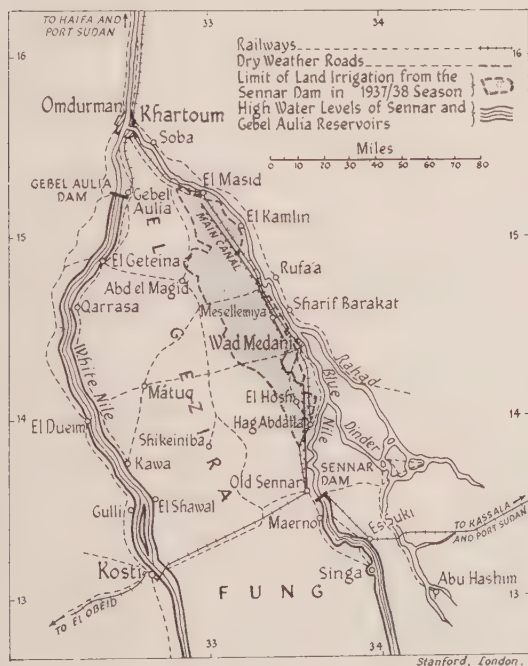
by A. R. LAMBERT

In the forty years which separate Kitchener's victory of Omdurman from our own day, the Anglo-Egyptian Sudan has been redeemed from savagery. For Egypt as well as for the Sudan itself, the work of bringing this vast province within the orbit of modern civilization has entailed many benefits; in the removal of an unceasingly restless frontier; in the opening up of a new market; in the further regulation and control of the Nile. At the heart of the transformation which Britain has accomplished lies the Gezira irrigation scheme herein described

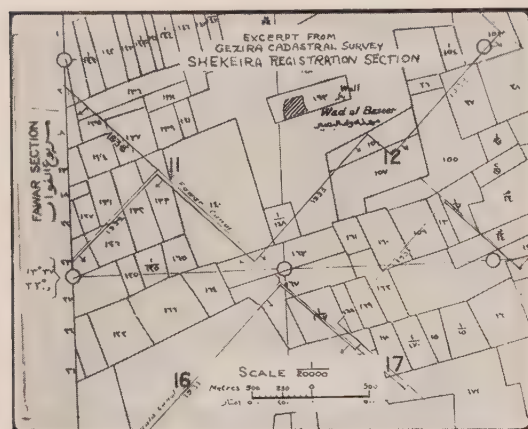
THE contours of the Gezira plain are almost ideal for irrigation, and the soil is suitable. It was in 1904, a few years after the reconquest of the Sudan, that Sir William Garstin, an eminent irrigation engineer, first drew attention to the suitability of the Gezira for irrigation, and the project was strongly supported by Lord Kitchener. The necessary preliminaries of surveys, railways, etc., were initiated, successful agricultural experiments under pump irrigation were carried out, and the construction of the dam at Sennar was begun in 1914. After being stopped by the war, the dam was eventually com-

pleted by Messrs. Pearson in 1925-26. The original scheme of 300,000 acres has since been extended to 842,341 acres in the 1937-38 season, although the area cropped each season has not increased to a corresponding extent owing to the larger proportion of fallow in recent years, and in the 1937-38 season the cropped area amounted only to about 332,000 acres.

The surveys included a most important measure. Land holdings were surveyed, and a register of titles made—a reform long overdue in Britain. The use of land lying within the proposed irrigation area was then compulsorily acquired, a high



annual ground rent being given on a 40-year lease.



Part of survey map showing how projected canals cut diagonally across original native holdings

A glance at the map showing the original holdings and the projected canalization proves how essential this measure was. Under the Mohammedan laws of inheritance, by which property must be sub-divided between the heirs, ownership is extremely complicated. Actually some of the smallest holdings have 20 to 30 owners, with varying proportional rights!

When the land was laid out for irrigation in 30-acre tenancies (altered to 40 acres after 1930-31), the original owners were granted tenancies in approximate proportion to their original holdings, 'landless' men being allotted the balance.

The Sudan Plantations Syndicate, which (with the Kassala Cotton Co. since 1929-1930) now administers the agricultural side of the scheme, came early upon the scene. In 1904, an American, Leigh Hunt, acquired an estate in the Northern Sudan, and brought educated negroes from America to settle in the land of their ancestors and to pass on to the natives the civilization which they had themselves acquired. The scheme failed, but out of it the Sudan Plantations Syndicate was formed and was eventually growing cotton on a concession of 10,000 acres.

In 1911, the Syndicate took over from the Government the first experimental irrigation area in the Gezira, and in 1913 the preliminary agreement with the Government (the basis of a further one made in 1919) was signed under Lord Kitchener's aegis in Cairo. These agreements determined the lines of subsequent development.

In accordance with their terms an initial area of 300,000 acres was to be irrigated under what was, in effect, a triple partnership of Government, Syndicate and Tenant. The Government provided irrigation; the Syndicate undertook land development and agricultural administration; and the Tenant did the cultivation. Profits on the sale of the crop were to be divided in fixed proportions; the Government took 35 per cent, the Syndicate 25 per cent, and the Tenant 40 per cent. This division applied only to the cotton crop. Other food and forage crops were to be the sole property of the Tenant.

The original concession was for ten years, with an option for a further four years, and there were various provisions enabling the Government to take over the entire concession with compensation to the Syndicate for capital expenditure. As a result of later agreements the period of the concession was extended until 1950, whilst the division of profit was altered to approximately 40 per cent for the Government and 20 per cent for the Syndicate, the Tenant's proportion remaining the same as before.

A partnership of this kind on such a scale is probably unique. On the whole it has worked very well. In particular it had the advantage that by delegating the commercial side of development, which included the raising of further capital additional to that required for the dam, the Government has been left free to devote all its energies to the essential task of organizing the administration of a 'new' country of immense size.



All photographs by A. R. Lambert

(Above) The two-mile long Sennar Dam on the Blue Nile was completed in 1926. By means of it more than 800,000 acres in the eastern Gezira are irrigated. (Below) One of the twelve regulators on the Main Canal which distribute water to the different canal zones





Stock-keeping among the natives is now specially encouraged, and experimental work is in progress with the aim of increasing the proportion of forage for cattle. Above on the right can be seen an escape regulator, used for discharge of surplus water to the river when pastures are endangered by heavy rains



After the agreement was signed further experience was obtained in other pump-irrigated areas within the concession area until 1925, when water became available from the Sennar Reservoir.

The total area of 842,000 acres in 1937 included a concession of 154,000 acres (originally 45,000) controlled by the Kas-sala Cotton Co., who transferred from the Gash Delta to a new concession west of the Syndicate area in the 1929-30 season, and two areas totalling about 8000 acres, in which the agricultural administration is carried on by the Government.

Besides the main irrigation scheme described here, which takes its water from the Blue Nile, other areas near the White Nile are now being irrigated by means of pumps. On the White Nile, too, 32 miles from Khartoum, is the great Gebel Aulia Dam, only lately completed, which for part of the year will transform the river into a narrow lake of some three miles broad stretching hundreds of miles to the south. This reservoir is solely for summer irrigation in Egypt, and its construction has only affected the Gezira Irrigation Scheme in that a large extension of the latter is now in progress for resettlement of the villagers whose lands along the White Nile will soon be submerged by the waters of the reservoir.

THE DAM AND CANALIZATION

From the engineering aspect the Gezira Irrigation Scheme has been very satisfactory. The Sennar dam and the canalization works have stood the test of time, and their design has made possible the accurate and efficient water distribution which has been achieved.

The dam itself is both a barrage and a reservoir. It acts as a barrage by raising the river water to the level of the Main Canal intake. A fall of approximately $4\frac{1}{2}$ inches per mile in the bed of the Main Canal allows irrigation by gravity flow to begin $35\frac{1}{2}$ miles away, owing to the 'steeper' fall in the levels of the plain.

By pumping water from the Main Canal ten miles upstream of this point, a considerable area of very fertile land has lately been added to the scheme.

The reservoir is formed by raising the level upstream of the dam another 13 feet, making a lake some 50 miles long, and this reservoir supplies the irrigation water from mid-January, when the whole of the river discharge is required in Egypt, till the end of March, when irrigation ceases.

The length of the dam is about two miles. It is built of solid granite on a foundation of hard Gabbro rock, with a rubble core towards the extremities where the water pressure is less. There are 80 deep sluice-gates, and 112 overflow spillways which allow the discharge of excess flood water. The latter represent the high level of the reservoir water, which is 50 feet above the river level at low Nile. An immense volume of water passes through the sluice-gates during the flood period, actually about 900 million tons in 24 hours, which is almost ten times more than the greatest known flood discharge of the Thames at London. As a margin of safety, provision is made for passing 20 per cent more than the greatest Nile flood recorded.

Some idea of the work involved in the canalization may be gathered from the total length of the canals: about 3000 miles of major and minor canals, and over 15,000 miles of field channels.

The irrigation water is distributed to the different canal zones at 12 regulators. The irrigation system is in three divisions under the Government Irrigation Engineers, who control the water supply up to the regulators of the major canals. The minor canals and field distribution of irrigation water are controlled by the Cotton Inspectors, who notify the Irrigation Engineers of the water requirements for these and supervise the actual irrigation of the crop.

The high measure of efficiency achieved in distribution is shown by the small

amounts of water which are 'escaped' to the river during the season after the rain period. This is actually now only 1.2 per cent of the Main Canal Intake at Sennar.

The general plan of the irrigation system is shown on the map. It forms a long irregular-shaped strip bordering the Blue Nile. This area covers some of the more thickly populated parts of the Gezira and is also adjacent to the railway and to Wad Medani, the capital of the Blue Nile Province. The population of the irrigated zone numbers about 250,000, including Wad Medani with about 33,000, and the remainder of the Gezira has about 150,000 inhabitants.

The canalized area is about 100 miles long by 35 miles wide at the broadest point, and further extensions are being made westwards. As the land levels in this direction are almost ideal for irrigation, except for a small 'ridge' of higher

land towards the centre of the Gezira, a very large area is available for further extensions.

In planning the irrigation scheme allowance had to be made for the tenants' lack of experience in irrigation of crops. For this reason canalization was designed to allow watering by day only, instead of by day and night as is usual in irrigation schemes. This was made possible by a system of weirs in the minor canals whereby the latter acted as reservoirs during the night. The impervious character of the soil, which is 60 per cent clay, prevents the seepage which otherwise would be a serious problem.

Although this system of day watering has several drawbacks from the engineering aspect and involves more costly canalization works and upkeep, the greater control of field irrigation which results probably more than offsets the disadvantages.

The land is laid out in fields 280 metres broad, usually 90 acres in area, which are sub-divided into 10-acre plots, all the plots within each field being sown with the same crop. Each tenant has a 10-acre section across each of the adjacent fields which make up the crop rotation.

THE CROPS

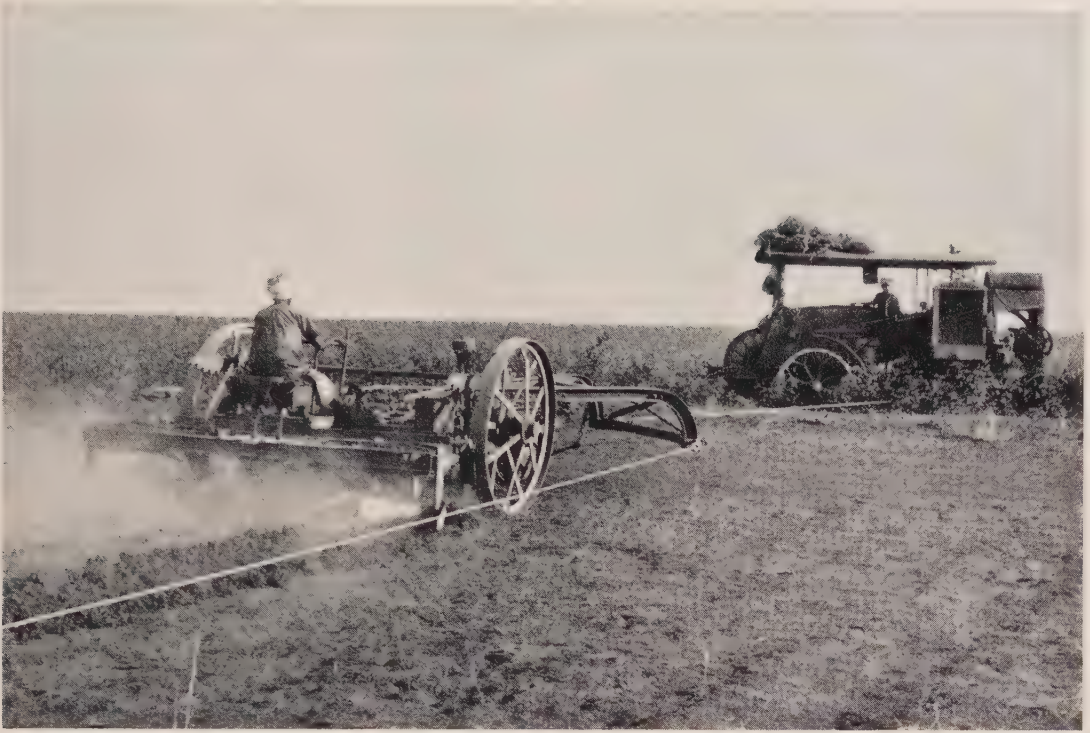
The canalized area is cropped in the approximate proportions of $\frac{1}{4}$ cotton, $\frac{5}{8}$ fallow and $\frac{1}{8}$ millet, the proportion of fallow being actually a little less than $\frac{5}{8}$ as small areas of *lubia* bean are also grown for fodder (*lubia* is very similar to the haricot bean). The proportion of fallow was increased after 1930-31 as a preventive measure against disease.

The land to be sown with cotton is cultivated and ridged by powerful oil-driven 'tackle' during the preceding fallow season, but no previous cultivation is given with other crops.

All the crops are sown in the rains of July and August with the exception of *lubia*, which is sometimes sown later. The rainfall varies from about 12 inches in the



British Inspectors arrange allocation of land with a prospective tenant. The head of the native administration for the area, representing the Government, is seated at the end of the table



Cotton takes up one quarter of the irrigated area. Before sowing, the land is cultivated and ridged by oil-driven 'tackle', which is pulled by cable backwards and forwards across the field

north to 20 inches in the south, nearly all of which falls within a period of three months. The millet is harvested by November, and the lubia dried off after December or January for grazing. The cotton is picked between the end of December and the end of April, after which the plants are pulled up and burnt to prevent disease.

Irrigation is given at 15-day intervals except in the hottest weather. The cotton is given water equivalent to about $4\frac{1}{4}$ inches of rain each water rotation. The 15 irrigations given, together with the first heavy irrigation before sowing and the rain, altogether are equivalent to about 90 inches of rain.

The cultivation and harvesting of the crops in the irrigated area provide employment, not only for the resident population, but also for large numbers of people who come in from outside.

After picking the cotton is brought by camel or train to the two groups of ginning factories in the central and northern areas; after 'ginning' the separated lint and seed go to Port Sudan for storage or shipment. Most of the crop eventually goes to England.

The cotton grown in the Gezira is of the fine Egyptian Sakelliridis type, which comes next in quality to the super-fine Sea Island cotton. It is used extensively for motor tyres, sewing cotton, fine shirts, ties, hosiery, etc. The seed contains 22 per cent, or more, of oil which is used for margarine, soap, paint, etc., whilst the crushed seed is a valuable cattle food.

ADMINISTRATION

For agricultural administration the land is divided into 'Blocks' averaging about 15,000 to 24,000 acres, each with a British staff of one to three. Four 'Group' In-



Cotton is sown during the rains of July and August. Into holes made with seluka, sowing-sticks, the 'followers' throw the seeds, afterwards pressing earth over them with their feet



Thinning takes place when the cotton is six weeks old or less. Surplus plants are pulled up to leave two or three to a clump, the clumps being some one and a half feet apart



Irrigations, with a total equivalent of ninety inches of rain, are given at 15-day intervals, and more frequently in hot weather. Even distribution is ensured by banking the channels

During the cotton harvest the normal working population is joined by an influx of about 70,000 casual labourers, many of them 'Fellata' pilgrims making the journey to Mecca



A good picker can gather up to 90 lb. in a day. The day's pick is collected into heaps; it is first cleaned and afterwards pressed into sacks in readiness for transportation



Camels loaded with bagged cotton crossing a small regulator on their way to a collecting station, whence the cotton will be taken by light railway to the nearest ginning factory





(Above) Outside a ginnery, sacks of seed and bales of lint await the arrival of the rail truck.
 (Below) The ginning machines, each with its own attendant, at work in the factory. The truck in the centre is collecting the separated lint and removing it for pressing





(Above) After ginning, the produce of the factories goes to Port Sudan for shipment or storage, most of it eventually coming to England. (Below) Irrigation ceases in early April, and at the end of the month the plants, about 25,000 per acre, are pulled up and burned





After sale of the crop a Cotton Inspector pays out profits to the tenants. Government, Sudan Plantations Syndicate and Tenant form the triple partnership under which the irrigated area is run

spectors over these are responsible to the Headquarters at Barakat.

The British Inspectors of the Syndicate (the Kassala Cotton Co. is run on the same lines) deal directly with their tenants—there are no native overseers as intermediaries. One may see the Cotton Inspector in his Austin-7 or Morris-8 inspecting the fields and giving 'chits' to tenants when they have sown or weeded their holdings, or picked the cotton opened since the previous watering.

This is, in fact, how the whole crop is grown. As each series of operations is performed the tenant is advanced the recognized cost, which is eventually deducted from the proceeds of sale of the crop, and the balance of the profit is then paid out to him. Payment by results ensures that the cost of the whole complex organization, by which water is eventually delivered to the tenant's plot, is not wasted

by the laziness or inexperience of individual tenants.

The close control and direction of agricultural operations by a British staff involves exacting work and is costly in salaries; but a high administrative efficiency is obtained. To carry out his duties successfully the Cotton Inspector must keep in close touch with the tenants and their sheikhs, a job for which personality, understanding and tact are required; and the Syndicate have done wisely in selecting a good type of man for the work.

This system has the disadvantage that it does not allow of much initiative or individual opportunity for the tenant. The present crop rotation, too, with its small forage area, restricts the number of stock which can be kept. Encouragement of stock-keeping is particularly desirable as it is the chief form in which the tenants' savings can be invested, and



Headquarters of the Blue Nile Province at Wad Medani, where the senior staff of the Government, representatives of British Commercial firms and officials of the Syndicate, hold their conferences

the keeping of stock also tends to increase the tenants' personal interest in the land which is so important for both social and economic stability.

Various measures are, therefore, now being tried to improve matters in these respects, by giving more responsibility to the tenants and encouraging mixed farming, especially stock, in experimental areas. It is, however, essential that, whatever changes are made, a high return from the cash crop, cotton, must be maintained until the large outstanding debt on account of the costly irrigation works has been considerably reduced.

In addition to the Cotton Inspectorate, the Engineering staff of the Syndicate control the ginneries, light railways, cultivating tackle, etc., as well as buildings. As the machinery alone represents a capital cost of over £1,000,000 this branch is of considerable importance.

The headquarters of the political administration of the Blue Nile Province and of the other departments—Irrigation, Medical, Police, Public Works, Veterinary and Surveys—are at Wad Medani. Under the Governor of the Province the Gezira is administered by three District Commissioners with two 'Gezira' Commissioners who act as liaison officers in matters involving the Syndicate and the tenants in the Irrigation area. The Administration includes the Mohammedan Sharia, a religious court presided over by the Mufti, for matrimonial cases, inheritance of property, and other cases which come under the Koranic law.

Under the British heads are large assistant staffs of Sudanese, who are being appointed to posts of greater responsibility as men of the necessary qualifications become available. In addition, the administration includes the Sheikhs and

Notables appointed under the system of 'indirect rule', which has already been mentioned in a previous article.

FINANCE

No reference has yet been made to the first essential for the development of the country, namely, finance. Besides the £2,775,000 share capital of the cotton companies, the Government borrowed over £10 millions for Gezira development under the British Government guarantee at times when interest was high. This is now being repaid by a long-term sinking fund.

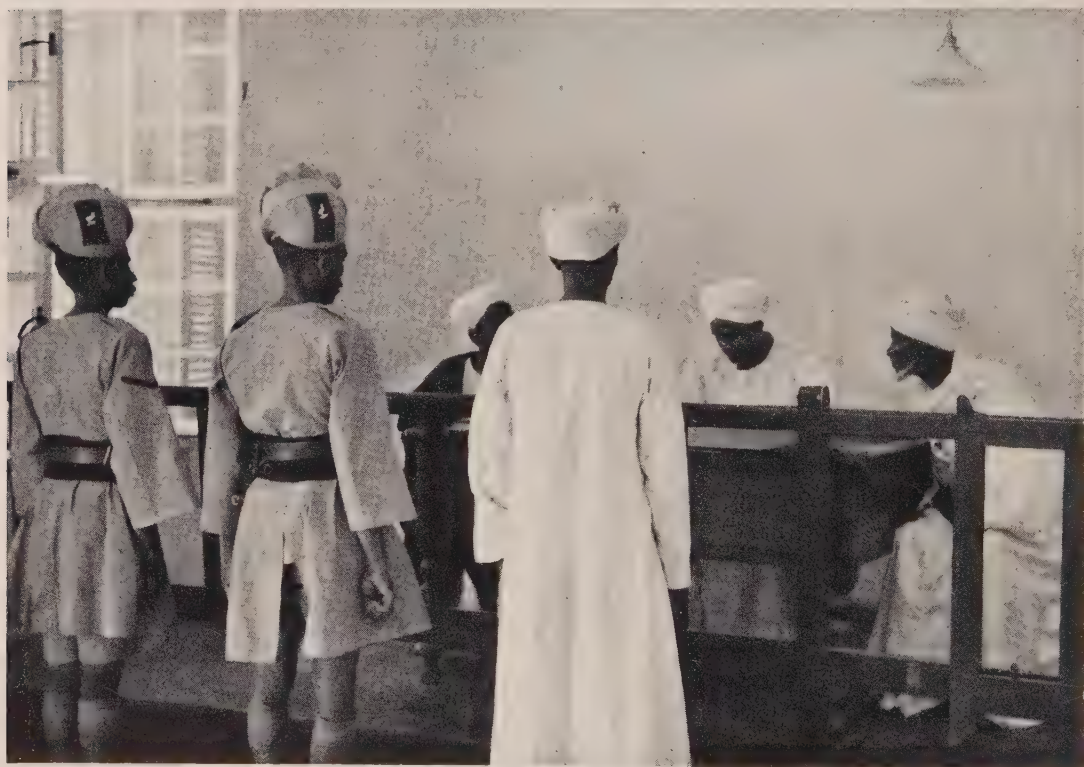
With cotton prices reduced from 19d. in 1927-28 to 8d. per lb. in late years an increase in return from the Irrigation Scheme has been essential in order to meet interest and capital charges. Accordingly a policy of extension has been followed.

By continuing this, and by improving the type of cotton; by better cultivation, and possibly, if feasible, by an increase in the proportion of land under cotton, further progress may be expected in the future.

SOCIAL AND ECONOMIC SERVICES

In planning the irrigation scheme generous provision for such things as medical, educational and research services was made. There are three hospitals, two of them large, as well as many dispensaries and village schools, with more advanced schools in the towns. The well-equipped research laboratories near Medani study agricultural problems under a Director of Research, and work in close co-operation with the Syndicate staff.

The veterinary work on animal disease

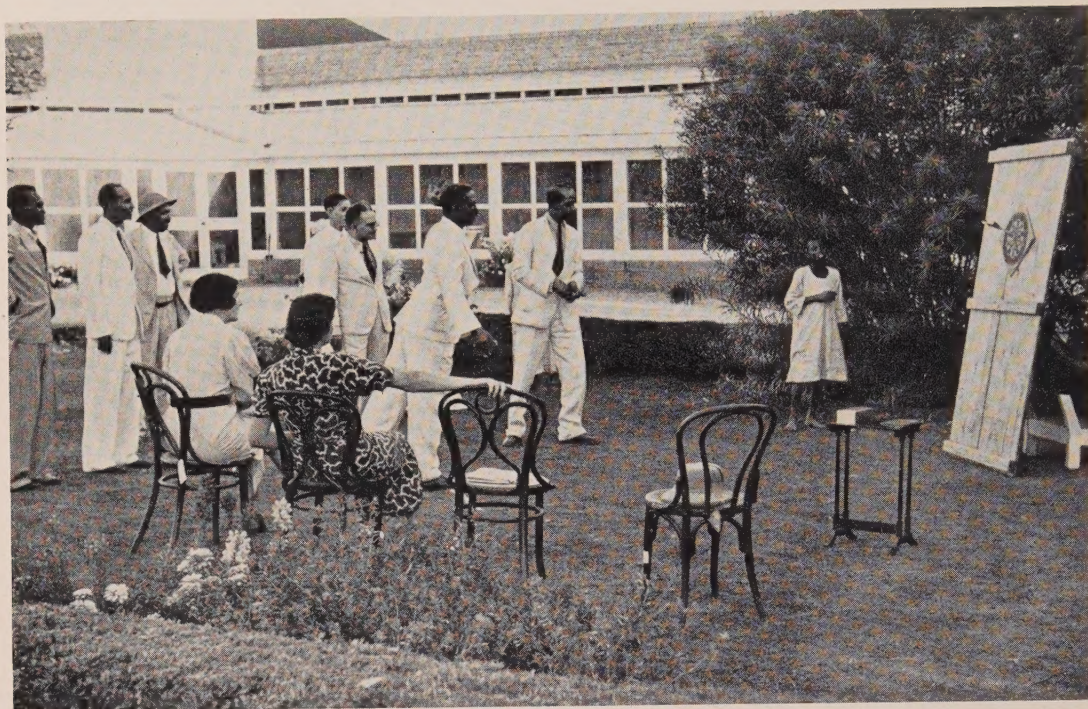


At Wad Medani native administration is represented by a municipal court, with a panel of magistrates under a president. An increasing number of minor cases is now dealt with by similar courts



Many innovations have been introduced into education. The curriculum of the larger schools now includes football, gardening, lessons in English and all the usual subjects. The formation of Scout troops is encouraged: that of Wad Medani Intermediate School is seen above





The Sudanese hold positions of considerable responsibility. They are on excellent terms with the British officials; and mutual interest and a desire to collaborate extend, it seems, even to the youngest members of their families

control touches the natives very directly. An example illustrates their attitude to it. For two years government camels were injected against the deadly 'sleepy sickness', but no native-owned camels were treated. In the third year, over 3000 were brought in, their owners willingly paying 5s. for each injection. They had been watching the results, and when they were satisfied that it was a good thing, they 'jumped to it'.

On the other hand, although undoubtedly there is now greater readiness to adopt new methods and ideas, a new interest is very liable to fade away very soon. The rate of real progress is limited by the character and traditions of the people.

In general, though of course there are individual exceptions, they do not like



Many amenities accompany life in the Gezira, for although the climate is excessively hot in early summer, it makes full atonement by its delightful freshness during the rains and the winter season

hard work; they are improvident, and their necessities are few. Perhaps the most important problem of the Irrigation Scheme as a whole is not an engineering or an agricultural but a psychological one. When the people want more of the things that money can buy, and want them sufficiently to be willing to work hard for them, the scheme will be more firmly established on foundations that will withstand long-continued economic depression.

LIFE IN THE GEZIRA

Although the climate of the Gezira is far from pleasant during the two hot seasons of the early summer (when the temperature is often 112° in the shade) and autumn, during the rains it becomes much cooler, and in the winter season,

November to March, it is often delightful. The families of the British staffs usually stay only for the winter and social activities are then in full swing.

The Club at Wad Medani with its swimming pool, tennis courts and shady gardens by the edge of the river, is very popular, and there are two other British clubs in the Gezira, as well as others of different nationalities at Medani. Polo, tennis, and even hockey and 'rugger' are played strenuously by the British, and 'soccer' has been taken up with great enthusiasm by the Sudanese, with football leagues whose matches are watched by great crowds of spectators.

In a village where there is no other sign of innovation one may often notice boys playing a scratch game of football. This is perhaps symbolical, for the boys



Dawn of day sees the natives at work behind their oxen; only by continued labour and sustained effort will they be able to reap the benefits of the larger dawn which is breaking over the Gezira

learn to play football at school, and influences emanating from the school are among the most important of those that are changing the outlook of the people. In the larger schools the boys and girls not only have lessons but their education includes such things as making up and performing plays (very successfully too) and forming Scout troops.

The numbers of Sudanese who have had the more advanced education at Gordon College in Khartoum are comparatively small, and they tend to form an 'intelligentsia' rather isolated from the remainder of the population. The assistant staffs of the government departments are recruited mainly from this group. The British staff are on very good terms both with their assistant staffs and with the people generally, though the Moslem

custom of seclusion of women prevents much social intercourse.

THE FUTURE

One wonders what may be the effect of all the changes on the people themselves. They have to work harder than before. What good will it do them?

The parable of the 'Fall' and the 'Curse' perhaps applies. 'By the sweat of thy brow' may be interpreted 'only by labour and effort can the people obtain what money can bring to the country—security from famine, doctors and medicines, education and knowledge, and a higher standard of life, both mental and physical.'

Much has been done and much still remains to be done to assist them, but a great deal depends on how the people themselves make use of their opportunities.